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Definition of "Armed Conflict" in Outer Space

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Abstract

Countries should follow the principle of peaceful development when developing and utilizing outer space resources and rights, but the increasing militarization or weaponization of space is contrary to this basic principle. The militarization or weaponization of space not only creates tension in international relations but also greatly increases the danger of armed conflicts in space. According to the basic theory of international humanitarian law, it can be deduced that once an armed conflict in outer space breaks out, the existing international humanitarian law can be applied. Then, determining the definition of "armed conflict in outer space" and the possible types of "armed conflict in outer space" are the prerequisites for the application of international humanitarian law. Although no armed conflict in outer space has actually broken out yet, it does not prevent us from conducting tentative research on the concept of "armed conflict" in combination with the characteristics of outer space activities.

Keywords

Outer Space, War, Armed Conflict, International, Non-International, International Humanitarian Law

1. Introduction

Article III of the Outer Space Treaty stipulated that using of outer space should be based on peaceful purposes. However, some countries, represented by the United States, interpreted it as a non-aggressive purpose and advocated that, on the premise of complying with Article 2 (4) of the United Nations Charter, they could not only use reconnaissance satellites for intelligence collection, but also deploy offensive weapons for self-defence, conduct peacetime military exercises, weapons testing, establish military orbital laboratories and other "peaceful military activities" (Meyer, 1969). Today, the militarization and weaponization of

outer space is difficult to avoid. "Militarization" and "weaponization" of outer space refer to the increasing military use of outer space and the deployment of weapons, which will lead to an arms race and military confrontation in outer space (He & Huang, 2000). Space security has increasingly become an important part of the national space strategy, and also related to global strategic stability and peace and security in outer space. How to avoid arm conflict or to protect national personnel and property after the outbreak of arm conflict are inevitable issues for countries when they use outer space in the future. When we discuss the application of international humanitarian law, the definition of "armed conflict" should be defined firstly.

In traditional international humanitarian law (IHL), although the concept of "armed conflict" has been mentioned repeatedly, treaty law does not provide a clear definition of what is "armed conflict". The definition and interpretation of "armed conflict" are largely left to state practice, international case law and legal scholars (Meltzer, 2019). Armed conflicts can generally be divided into international armed conflicts and non-international armed conflicts. Legally, no other type of armed conflict exists (ICRC, 2008-01). We often discuss the situation in which non-international armed conflicts turn into international armed conflicts, and we call it the internationalization of non-international armed conflicts. This generally occurs in cases of foreign involvement, which, nonetheless, does not make it a third form of armed conflict. In terms of norms of international law, IHL rules applicable to international armed conflicts are much more diverse than those applicable to non-international armed conflicts, even though humanitarian and military principles are essentially the same in both types of conflicts (ICRC, 2016).

2. International Armed Conflict in Traditional IHL Theory2.1. Criteria for Determining International Armed Conflicts

International armed conflict exists when two or more countries resort to armed forces (ICRC, 2008-01). Article 2 (1) of the Geneva Convention of 1949 provides that, in addition to the provisions which shall apply in peacetime, this convention shall apply to all declared wars between two or more contracting states, or to any other armed conflicts, even if one of them does not recognize a state of war. Article 2 (2) provides that the convention shall apply whenever part or all of the territory of a contracting state is occupied, even if such occupation is not met with armed resistance. For states that have ratified the Additional Protocol I, pursuant to Article 1 (4), the situation referred to in Article 2 above also includes a situation in which peoples are exercising rights under the Charter of the United Nations in relation to the right to self-determination, armed conflict against colonial domination and foreign occupation, and fighting against racist regimes. In the traditional theory of IHL, the legal elements and corresponding standards for judging whether it is an international armed conflict mainly include the following:

2.1.1. Legal Status of the Belligerents

The belligerents are mainly states, and in some cases, they also include specific types of national liberation movements in the countries concerned. At least one state is involved in an international armed conflict. Armed confrontations between parties that are neither states nor national liberation movements cannot be considered international armed conflicts but may constitute non-international armed conflicts or other situations of violence (Meltzer, 2019). The understanding of international armed conflicts in a broad sense may also include some special armed conflicts, such as the anti-terrorism war triggered by the country's attack on foreign terrorist organizations.

2.1.2. Nature of Confrontation

Traditionally, nations have expressed their belligerent intentions by formally declaring war. Today, an international armed conflict can be presumed whenever one country uses force against another country, no matter what the reason for the confrontation is, no matter how intense it is, and no matter whether a country officially declares or recognizes a political state of war (Meltzer, 2019). Of course, this point of view is still controversial, so the existence of an international armed conflict mainly depends on the case-by-case analysis of the actual situation (ICTY, 2005). Even if a belligerent does not recognize the opposing government or denies the existence of a state of war altogether, a situation can constitute an international armed conflict and trigger the application of IHL.

2.1.3. Time Frame

IHL, which governs international armed conflicts, applies with the declaration of war, or, in the absence of such a declaration, with the actual use of force as an expression of intent to belligerent. The mere fact that a state invades another state without occupying all or part of its territory can also give rise to the application of IHL, even if the invasion is not confronted with armed resistance. The end of an armed conflict must be determined on the basis of facts and objective criteria, i.e. the armed confrontation between the belligerent parties has ended permanently in what can reasonably be interpreted as the general cessation of military operations (Greenwood, 2008). Moreover, the fact that a conflict has in fact ended does not preclude the continued application of certain provisions of IHL (Meltzer, 2019).

2.1.4. Geographical Scope

IHL can be applied outside the territory of the belligerents. IHL applies to the area where the actual fighting takes place among the belligerent countries and any intersecting actions. In fact, under the traditional laws of war, relations between belligerent states are governed by IHL wherever they confront each other, even though neutrality laws may prevent them from engaging in hostilities outside their own territories, in international space or on the high seas (Meltzer, 2019).

2.2. Criteria for Determining Non-International Armed Conflicts

A non-international armed conflict is a protracted armed confrontation between

government armed forces and one or more armed groups, or between these groups on the territory of a party to the Geneva Conventions. Armed confrontation must reach a minimum level of intensity and parties to the conflict must demonstrate a minimum level of organization (ICRC, 2008-01). The IHL governing non-international armed conflicts mainly consist of Article 3 and Additional Protocol II. The legal elements and corresponding standards for judging whether it is a non-international armed conflict mainly include the following:

2.2.1. Level of Organization

A minimum level of organization is the determining factor, and government forces are generally considered to meet this criterion. In practice, however, the degree of organization of a non-state armed group is assessed on the basis of a number of factors, including the command structure, disciplinary rules and mechanisms within the group, headquarters, the control of certain territory, the ability to obtain weapons and other military equipment, the ability to recruit and conduct military training, the ability to plan, coordinate and conduct military operations (including troop movement and logistics), the ability to develop a unified military strategy and use military tactics, and the ability to speak with one voice and to negotiate and conclude a ceasefire agreement or a peace agreement (ICTY, 2008-02). Furthermore, Article 1 of Additional Protocol II states that situations of internal disturbance and tension, such as riots, isolated and sporadic acts of violence and other acts of a similar nature do not constitute an armed conflict.

2.2.2. Intensity

Given the diversity of situations of non-international violence, whether they can be classified as armed conflicts always depends on a careful assessment of the specific situation, rather than a uniform definition, especially when the intensity is low. Factors for assessing "intensity" include the number, duration and intensity of the confrontation; the type of weapons and other military equipment used; the quantity and caliber of ammunition fired; the number and type of troops involved in the fighting; the number of casualties; the extent of the destruction; and the number of civilians fleeing the fighting zone. The involvement of the UN Security Council can also reflect the intensity of the conflict (Meltzer, 2019).

2.2.3. Time Frame

In terms of time frame, a non-international armed conflict begins whenever armed violence between sufficiently organized parties reaches the required level of intensity. Although these elements provide objective criteria for defining a situation of armed conflict, in reality, they are often interpreted flexibly (especially by governments involved in the conflict). Once a non-international armed conflict has begun, IHL applies until a peaceful resolution is achieved. In practice, the end of a non-international armed conflict requires the end not only of actual hostilities but also of associated military operations of a belligerent nature,

and the possibility of their recommencement can reasonably be ruled out under the circumstances (Meltzer, 2019).

2.2.4. Geographical Scope

In terms of territorial scope, the applicability of Article 3 and Additional Protocol II is limited to armed conflicts occurring "in the territory" of a contracting state. The Protocol even requires that armed conflict needs to occur on the territory of a belligerent. Today, however, geographical limitations on the scope of application of common Article 3 and Additional Protocol II no longer serve their original purpose. In situations of non-international armed conflict, IHL not only applies to the area where actual hostilities are taking place, it essentially governs any act or action committed on grounds related to the conflict (belligerent link), wherever it occurs. Ultimately, the characterization of a non-international armed conflict is not based on its limited or unlimited geographical scope, but on the nature and character of the parties involved, the actual occurrence of hostilities and other acts or actions with a belligerent link (Meltzer, 2019).

3. Potential Difficulties in the Application of IHL in Armed Conflicts in Outer Space

3.1. The Definition of "Armed Conflict in Outer Space" Is Still Unclear

There is no definition of "armed conflict" in international law, let alone "armed conflict in outer space". However, scholars have analyzed several situations in which armed conflicts in outer space may occur. In addition to armed conflicts directly occurring in outer space, armed conflicts on the ground may also involve outer space (such as attacking targets on the ground with space-based outer space weapons). In this sense, "armed conflicts in outer space" should include warfare from, through and within space (Yang, 2018).

3.2. It May Be Difficult to Determine When an Armed Conflict in Outer Space Begins

In general, IHL applies once the criteria for the existence of an armed conflict are met. However, the nature of outer space raises specific problems with regard to the application of laws established for terrestrial conflicts, since time seems to pass more slowly over the great distances involved in wars in outer space. In terrestrial combat, the effects of a physical attack are often felt almost immediately after the attack begins. By contrast, Earth's kinetic attack on space in some cases will last for hours until its effects are felt. So in an armed conflict in outer space, when exactly does the law start to apply? Is it the moment the weapon is fired, or hours after it reaches its target? (Macak, 2018)

3.3. Non-International Armed Conflict May Not Exist

Article 7 of the Outer Space Treaty provides for the regime of responsibility and liability in space law, setting out the general principle that the state launching the

space objects is internationally responsible for damage caused to other states or their natural or legal persons on space objects. This principle is further developed in Article 2 of the Convention on the Liability of States Parties. This provision establishes a regime of absolute liability, under which the launching state must pay compensation for "damage caused by its space object to the Earth's surface or to an aircraft in flight" regardless of whether the object is governmental or non-governmental. Moreover, Rule 60 of the Tallinn Manual 2.0 provides that a state is generally responsible for the cyber activities of its non-governmental entities in outer space and must authorize and continuously monitor such entities, even if these entities operate space objects registered by another state.

If states are responsible for the actions of non-international organizations, will there still be non-international armed conflicts? After all, it seems difficult for NGOs to develop space technology or have capabilities to attack in space in the short term, even after the organization becomes a new sovereign. Additionally, this issue may also involve more complex topics, such as the identification of the beginning of an armed attack. Further research on basic theoretical issues such as actual control theory is needed.

3.4. The Element of "Territory" May Be Difficult to Define in Outer Space

The distinction between international armed conflicts and non-international armed conflicts mainly lies in the territorial scope. According to common Article 3 of the Geneva Conventions and Additional Protocol II, armed conflicts of a non-international character are limited to armed conflicts "occurring" in the territory of one party, taking into account the nature and characteristics of the parties involved, the actual occurrence of hostilities and other associated behaviors. But outer space belongs to the international commons, and there seems to be no such thing as territory. If the territorial scope cannot be determined, how to differentiate international and non-international armed conflicts?

Another related question is: are there fictitious territories in outer space? Ships and aircraft in international law have the nature of fictitious territories, and relevant countries enjoy quasi-territorial jurisdiction over them. There are provisions concerning quasi-territorial jurisdiction under Article 91 of the United Nations Convention on the Law of the Sea and Article 17 of the Convention on International Civil Aviation. By the same token, the state which registered an aircraft has quasi-territorial jurisdiction over the persons and objects inside the aircraft and the events that occurred there (Zhao, 2022). However, there is currently no legal agreement/treaty as to whether space objects or space stations can be regarded as fictional territories.

3.5. It Is Difficult to Judge the Degree of "Intensity" of Armed Conflict in Outer Space

Generally speaking, as long as one country uses force against another country, regardless of the intensity, it can be presumed that there is an international

armed conflict. However, in non-international armed conflicts, the intensity of the use of force must reach a certain threshold, and the assessment of "intensity" requires an analysis of specific issues. The judgment of this threshold in the non-spatial field is still unclear and controversial, and there will be more ambiguity in the outer space armed conflicts.

3.6. The Degree of "Organization" in Non-International Armed Conflicts Is Difficult to Determine

In a non-international armed conflict, at least one non-state organized armed group is involved in hostilities, and it is "organized" if it is under an established command structure and is capable of sustained military operations.

Modern space activities rely heavily on the Internet, which raises the question of "virtual" organizations, that is, all activities related to organizations take place online. Do these "virtual" organizations meet the threshold of "organization" in non-international armed conflicts?

A more difficult situation is that of informal groups of individuals who are not cooperating but acting "collectively", that is, simultaneously but without any coordination (e.g. a situation where an informal group with a common goal visits a common website containing tools and vulnerable targets, but does not organize a cyberattack in any way). The categorization of this situation needs further analysis.

4. Types of Armed Conflicts in Outer Space and Their Elements

Since there is no specific definition of armed conflict in traditional IHL, we might as well borrow the basic concept of traditional IHL and understand it in the context of outer space. As mentioned above, "armed conflicts in outer space" should include warfare from, through and within space. Although this type of armed conflict has not actually occurred, it is expected that such a situation may become a reality in the near future (Boothby, 2018).

In general, IHL applies once the criteria for the existence of an armed conflict are met. But the distances involved in wars in outer space are so great that time seems to pass more slowly. Some people believe that launching an anti-satellite weapon against another country's space assets is tantamount to taking hostile actions against that country, which means the start of an armed conflict. If the attempted attack is followed by no belligerent actions by either party, it can only indicate that the armed conflict lasted relatively short but cannot deny the existence of an armed conflict (Macak, 2018).

4.1. International Armed Conflict in Outer Space

An international armed conflict exists as long as the "international" and "armed" criteria are met. The decision is factual and international armed conflict can exist even if one party does not recognize the conflict itself (Schmitt, 2017).

4.1.1. The "International" Element

During the preparation of the Tallinn Manual 2.0, some international experts agreed that a conflict is international if two or more states are involved as opposing parties.

A conflict is also an international conflict when an organized armed group under the "full control" of one state engages in hostilities against another state. As a practical matter, it may be difficult to determine whether a state is controlling the cyber activities of a non-state actor. An armed conflict is "international" in nature when one state exercises overall control over an organized group that attacks another state's space object and causes significant physical damage. Merely supporting a group of non-state actors involved in a non-international armed conflict does not "internationalize" the conflict.

The international expert panel for Tallinn Manual 2.0 agreed that the bar for "internationalization" is high. For example, experts believe that simply taking steps to sustain the rebels is not enough. Likewise, providing rebels with space attack tools would not meet the threshold. In contrast, the threshold can be met by providing specific intelligence for conducting space attacks.

Overall control does not apply to the behavior of individuals or poorly organized groups. According to the International Criminal Tribunal for the Former Yugoslavia, those individuals or groups must have specific instructions (or subsequent public approval) from a state before they can attribute their actions to that state in order to determine whether an international armed conflict exists.

4.1.2. "Armed" Element

While it is undeniable that hostilities are a prerequisite for the "armed" component of an international armed conflict, there is debate about the degree of necessary violence. According to the ICRC's comments on the 1949 Geneva Conventions, any controversy that arises between two states and leads to the intervention of the armed forces is an armed conflict...how long the conflict lasts or how many massacres does not matter in the determination of armed conflict. The opposing view calls for greater scope, duration, or intensity of hostilities. Advocates of this opposing view point out that state practice shows that isolated incidents, such as sporadic border skirmishes or naval incidents, are not considered international armed conflicts.

Moreover, there are situations in which "armed" conflicts do not require the use of armed forces, nor is the involvement of armed forces decisive. In other cases, the law of armed conflict applies despite the absence of hostilities. In particular, belligerent occupation, achieved without armed resistance, would legally trigger the application of this IHL. Furthermore, an international armed conflict may arise simply by declaring war.

4.1.3. Neutral Countries

During an international armed conflict, a neutral state may not distinguish belligerents with respect to actions of an armed conflict in outer space within its territory, territorial waters or airspace. It is generally difficult for a neutral coun-

try to "observe" armed conflicts in outer space originating from or targeting its territory, territorial waters or airspace. If such activities come to the country's attention, the neutrality law requires the country to take action to end them. This can be achieved through outer space but is not limited to outer space.

Neutrality laws prohibit belligerents from using the territory, territorial waters or airspace of neutral countries as bases for outer space operations against their opponents. The 13th Hague Convention of 1907 prohibited belligerents from placing on neutral territory or waters "any apparatus intended for communication with belligerents by land or sea". According to this rule, the deployment of infrastructure for armed conflict in outer space in these areas should be prohibited.

In addition, a neutral state may, but is not obliged to, allow outer space operations of belligerents to only "go through" its territory, territorial waters or airspace, and may impose conditions and restrictions on such passage, provided that such conditions and restrictions apply equally to all belligerents. During the passage-only period, belligerents shall not use neutral territory, territorial waters or airspace as a base against their opponents for activities related to armed conflict in outer space.

4.2. Non-International Armed Conflicts in Outer Space

4.2.1. Level of Organization

For a non-international armed conflict to exist, at least one non-state organized armed group must be involved in the hostilities. The group is "organized" if it is under an established command structure and is capable of sustained military operations, not necessarily at the level of a regular military disciplined force.

So how to identify a "virtual" organization which carries out all its organization activities online? The first example is an organization that operates "cooperatively" with its leadership coordinating its activities. Under the Tallinn Manual 2.0, some experts pointed out that if such armed groups actually exist, there is no way to enforce the law against individuals without physical contact. International experts are divided on whether such difficulties would prevent the application of IHL to organized armed groups.

A more difficult situation is that of informal groups of individuals who are not cooperating but acting "collectively", that is, simultaneously but without any coordination. Imagine a situation where an informal group attacks a space object with a common goal, but does not organize the space attack in any way. All experts preparing the Tallinn Manual 2.0 agree that the mere fact that individuals act towards collective goals does not seem to meet organizational criteria.

In space, it has been argued that destructive hostile activities by private actors, such as space technology companies, do not give rise to the application of the laws of war unless they are organized and structured like armed groups. For armed groups engaged in hostile space operations, the minimum organization criteria would apply to groups engaged in ground conflicts (Macak, 2018).

4.2.2. Intensity

First, to judge the intensity of armed conflicts in outer space, we mainly refer to the "impact" caused by armed conflicts. One of the purposes of IHL is to minimize damage to civilians or civilian objects. At present, there are not many civilians in outer space in any case. There may be a large number of civilian objects in outer space, but the means of attacking these civilian objects, the types of weapons and other military equipment used, etc. do not have great reference value. Some scholars have pointed out that an attack on a country's space infrastructure is usually not enough to trigger a non-international armed conflict, and the victim country is likely to interpret such incidents as acts of terrorism (Macak, 2018). However, if a jamming attack on a nation's space system is followed by a large-scale ground conflict that results in a large number of casualties and significant material damage, this is a non-international armed conflict (Macak, 2018).

Second, the "indirect impact" of an armed conflict in outer space rather than the "direct impact" should be considered. In the field of traditional armed conflict, the "direct impact" of an armed conflict may be casualties of the civilian population or extensive damage to civilian objects. And it can be judged in combination with the duration of the attack—the longer the duration, the more intense the conflict. However, in the field of outer space, the "direct impact" may be only short-term and small-scale damage (even just destroying a chip of a space object), but this may lead to very serious "indirect impact". For example, the destruction of space objects by kinetic energy weapons can produce a large number of debris, and the "direct impact" is just the shattering of a certain space object, which does not seem to be very violent. However, these debris clouds may have unpredictable impacts on the space environment and the safety of the earth, having huge "indirect impacts".

Third, when judging whether the "indirect impact" has reached the threshold of intensity, it is necessary to analyze specific issues such as the location of the "indirect impact". If the "indirect impact" of armed conflict mainly occurs in the non-space domain, such as destroying satellites and causing large-scale power outages and network interruptions on the ground, which seriously affects the normal life of residents, traditional international humanitarian standards can be used to judge whether they have reached the threshold of intensity. Generally speaking, the longer the duration, the greater the number of casualties on the ground and the number of civilians affected, and the greater the scope of physical damage to the ground, the higher the intensity. However, if the attack's "indirect impact" occurs in outer space, such as the debris cloud mentioned above, its "direct impact" is the damage to space objects, and its "indirect impact" is the generation of the debris cloud. The "indirect impact" may further cause "third-level impact", i.e. damage to civilians or civilian objects on the ground caused by the debris cloud.

Fourthly, the appeal judgment of *Tadić* states that the violence of an armed conflict with a non-international character must be "protracted". This does not

mean that the violence needs to be continuous. Space attacks that occur frequently but not continuously over a relatively definite period of time can be characterized as long-term attacks.

Furthermore, "situations of internal disturbance and tension, such as riots, isolated and sporadic acts of violence, and other acts of a similar nature" are expressly excluded from the scope of IHL. This criterion, enshrined in Article 1 (2) of Additional Protocol II, is recognized today as a customary international law that distinguishes non-international armed conflict and hostilities that do not reach the threshold for such a conflict. Sporadic attacks in space do not constitute non-international armed conflicts, nor do operations in outer space that incidents such as civil unrest or domestic terrorism.

4.2.3. Geographical Scope

For the purpose of maximizing the protection of humanity, any military activity in outer space will be governed by the laws of war, not only with regard to direct actions but also with respect to their effects elsewhere, including on Earth (Freeland, 2011). The absence of an element of territory does not preclude the application of IHL in relation to non-international armed conflicts.

First, according to common Article 3 of the Geneva Conventions, non-international armed conflicts take place on the territory of "a" contracting state. How should the term "a" in this provision be interpreted?

During the drafting of the Tallinn Manual 2.0, there is a view that the word "a" in the aforementioned provision means that non-international armed conflicts are limited to armed conflicts occurring within the territorial boundaries of a single state. According to this interpretation, armed conflicts that cross borders may generally be regarded as international armed conflicts. Armed conflicts in outer space all occur or pass through areas that do not belong to the territory of any country, so armed conflicts in outer space are all international armed conflicts, and there are no non-international armed conflicts.

According to the second view, "a" refers to the territory of any state party. Therefore, the transmission of data via network infrastructure located outside the country in which a non-international armed conflict is taking place does not make the conflict an international one. This interpretation is supported by the Tallinn Manual 2.0, as cyber activities that facilitate non-international armed conflict are likely to be launched remotely, far from the sites of conventional hostilities. Some countries have weak regulatory regimes for the cyber activity or are technically incapable of effectively policing cyber activity taking place within their territories. This provides an attractive base of operations for those conducting cyberattacks on governments during non-international armed conflicts. Since most of the current armed conflicts in outer space rely on the Internet, this second interpretation can also be applied to outer space armed conflicts.

Second, with regard to armed conflict within space, we can turn our attention to non-territorial elements. One possible route is to count the number of sovereign states involved in the armed conflict. If there is only one sovereign state, then naturally there is no "internationality", let alone "international armed conflict"; on the contrary, if there are two or more sovereign states, its "internationality" is self-evident.

5. Conclusion

Although armed conflicts in outer space have never really broken out, with the gradual emergence of the militarization and weaponization of outer space, armed conflicts in outer space may become a reality in the not-too-distant future. IHL cannot fundamentally prevent wars, but it has always been committed to letting the sunshine of civilization shine into wars and preventing human beings from being completely drawn into cruelty and darkness. IHL can be applied to future armed conflicts in outer space. The existing basic principles of IHL, as well as international humanitarian rules in the land, sea, aviation, and cyber fields, may also be applicable. All parties to the conflict should fully abide by the principles and rules of IHL, depending on the combat situation. Based on the common interests of all mankind, all parties to the conflict should agree not to engage in hostile actions in special areas, such as places with dense space assets of various countries, places with fragile space ecological environments where space debris gathers, and places where rare or fragile land and marine organisms are located. When conducting operations in areas over which neutral states enjoy sovereignty, jurisdiction, or other rights under general international law, belligerents are required to have due respect for the legitimate rights and responsibilities of those states. Regarding the time range of an armed conflict in space, once the criteria for the existence of an armed conflict are met, IHL begins to apply. Based on the purpose of IHL, the scope of application of IHL should be maximized.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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