

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO., LTD.,  
Petitioner,

v.

WILUS INSTITUTE OF STANDARDS AND TECHNOLOGY  
INC.,  
Patent Owner.

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Case No. IPR2025-00935  
U.S. Patent No. 11,129,163

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**PATENT OWNER’S EXHIBIT LIST**

<b>Exhibit</b>	<b>Description</b>
200 1	Order, <i>Wilus Institute of Standards and Technology Inc., v. HP Inc.</i> , Case No. 2:24-cv-00752-JRG-RSP, Dkt. No. 130 (June 11, 2025) (“Docket Control Order”)
200 2	Excerpt from Exhibit G-22 to Invalidity Contentions Served on February 13, 2025 in the consolidated case <i>Wilus Institute of Standards and Technology Inc., v. HP Inc.</i> , Case No. 2:24-cv-00752-JRG-RSP
200 3	Interim Processes For PTAB Workload Management, March 26, 2025, <a href="https://www.uspto.gov/sites/default/files/documents/InterimProcesses-PTABWorkloadMgmt-20250326.pdf">https://www.uspto.gov/sites/default/files/documents/InterimProcesses-PTABWorkloadMgmt-20250326.pdf</a>
200 4	FAQs for Interim Processes for PTAB Workload Management), retrieved from <a href="https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management">https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management</a>
200 5	Guidance on USPTO’s recission of “Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation”, March 24, 2025, <a href="https://www.uspto.gov/sites/default/files/documents/guidance_memo_on_interim_procedure_recission_20250324.pdf">https://www.uspto.gov/sites/default/files/documents/guidance_memo_on_interim_procedure_recission_20250324.pdf</a>
200 6	Excerpts from U.S. District Court – National Judicial Caseload Profile for the Eastern District of Texas, March 31, 2025, <a href="https://www.uscourts.gov/sites/default/files/document/fcms_na_dist_profile0331.2025.pdf">https://www.uscourts.gov/sites/default/files/document/fcms_na_dist_profile0331.2025.pdf</a>
200 7	Screenshot regarding Judge Rodney Gilstrap’s average time to trial from July 22, 2024 until July 22, 2025, retrieved from <a href="http://www.docketnavigator.com">www.docketnavigator.com</a>

Patent Owner's Preliminary Response  
IPR2025-00935 (U.S. Patent No. 11,129,163)

200 8	Excerpts from Invalidity Contentions Served on February 13, 2025 in the consolidated case <i>Wilus Institute of Standards and Technology Inc., v. HP Inc.</i> , Case No. 2:24-cv-00752-JRG-RSP
200 9	Dennis Crouch, Estoppel Guttled: A Pelican's Guide to Patent Litigation, <a href="https://patentlyo.com/patent/2025/05/estoppel-pelicans-litigation.html">https://patentlyo.com/patent/2025/05/estoppel-pelicans-litigation.html</a>
201 0	Letter re "Notice of Wi-Fi 6 License offer" from Sisvel to Samsung Electronics Co., Ltd. with Attachments 1-2, April 8, 2022
201 1	Intentionally Omitted
201 2	Declaration of Jin Sam Kwak
201 3	List of Licensees to Wi-Fi 6 from Sisvel, <a href="https://www.sisvel.com/licensing-programmes/Wi-Fi/wifi-6/#tab-list-of-licensees">https://www.sisvel.com/licensing-programmes/Wi-Fi/wifi-6/#tab-list-of-licensees</a>
201 4	U.S. Pat. No. 12,058,230
201 5	Excerpts of File History of U.S. Pat. No. 12,058,230

## **I. Introduction**

The Petition fails to establish that the alleged prior art discloses the element of “not [to use/using] a Basic Service Set (BSS) color when signaling information indicates that an operation based on the BSS color is not allowed” in all challenged independent claims (i.e., Claims 1 and 9)<sup>1</sup>. The signaling information in Lee indicates a trigger frame. The signaling information in Choudhury indicates whether a device is a low-power device or whether the device is in the same BSS as the access point. None of the alleged signaling information in the prior art indicates that “an operation based on the BSS color is not allowed.” The Petition’s attempt to perform word matching with Lee and Choudhury, even though those references teach something very different than what the patent claims, further demonstrates why the Petition fails to establish a reasonable likelihood that Petitioner would succeed in showing that the prior art discloses or renders obvious any of the challenged claims. For at least these reasons, the Board should deny institution.

## **II. Overview of the '163 Patent**

The '163 Patent is a continuation of PCT Application No. PCT/KR2017/002407 filed on March 6, 2017, which claims priority to the

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<sup>1</sup> The Petition relied on additional references in combination with the primary references for some of the dependent claims. Patent Owner reserves the right to argue whether these references in fact qualify as prior art at a later stage.

following Korean patent applications: 10-2016-0026684 filed on March 4, 2016; 10-2016-0029975 filed on March 12, 2016; 10-2016-0044465 filed on April 11, 2016; 10-2016-0057597 filed on May 11, 2016; 10-2016-0114821 filed on September 7, 2016. '163 Patent at 1:10-23.<sup>2</sup>

The '163 Patent describes techniques for next-generation wireless communication technology that is capable of efficiently utilizing bandwidth by simultaneously transmitting data between a plurality of terminals and base stations. *See* '163 Patent at 2:42-59. The '163 Patent's technology is utilized by products that implement the Wi-Fi 6 (IEEE 802.11ax) standard for wireless communications.

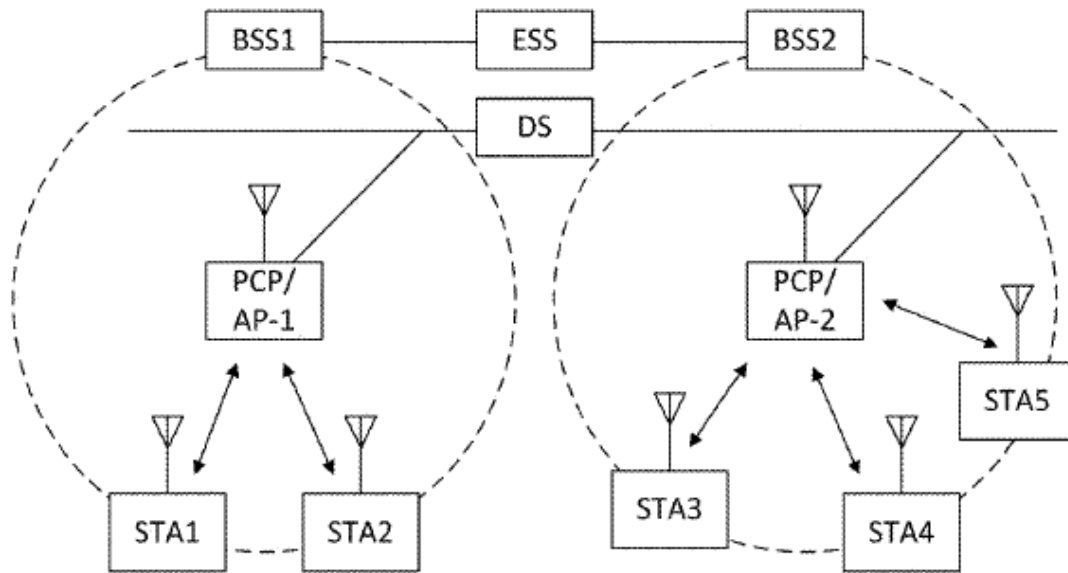
The '163 Patent addresses the issue of Basic Service Set (BSS) color collisions, which occur, e.g., in situations where two Wi-Fi networks' coverage overlap in space utilize the same BSS color value. The '163 Patent enables performing BSS color-based operations when there is a color collision, even though such operations can no longer be performed using the color that was the source of the collision.

Using BSS color is a new feature in Wi-Fi 6 that enables devices operating in the same frequency space to quickly distinguish between data

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<sup>2</sup> Patent Owner's Discretionary Denial Brief (Paper 9) did not list these Korean patent applications that the '163 Patent claims priority to since they are not necessary for purposes of the discretionary denial brief.

units from their own BSS and those from another BSS by simply referencing the BSS color value contained in the HE PHY header. The figure below demonstrates a wireless environment with two different BSSs, where the BSSs' respective coverage spaces do not overlap.



**FIG. 1**

'163 Patent, FIG. 1.

The BSS color is assigned a value from 0 to 63. The BSS color field is located in the high efficiency physical layer (HE PHY) header of a data unit.

A wireless communication terminal, such as a cellphone or a laptop, may receive a wireless signal that has a certain BSS color assigned to a given communication channel between a base wireless communication terminal, such as an Access Point (AP), and that wireless communication terminal. '163 Patent at 3:1-19. The wireless communication terminal can perform

operations such as Network Allocation Vector (NAV) update and Clear Channel Assessment (CCA) adjustment, among other operations, based on the BSS color assigned to it.

One problem addressed by the '163 Patent is that in dense network environments, BSS color collisions occur when two or more BSSs operating on the same frequency channel (and overlapping in coverage area) use the same BSS color. *See* '163 Patent at 2:46-59, 10:41-62. In other words, a wireless communication terminal receives a signal with the same BSS color that device understands applies to it, even though the signal is intended for another device in a different BSS (albeit using the same BSS color). When a color collision is detected, the wireless communication terminal reports to the base wireless communication terminal, which will indicate that a color collision has occurred.'163 Patent at 3:16-20.

The '163 Patent is directed to handling operations based on BSS colors in the presence of BSS color collisions. *See, e.g.*, '163 Patent at 16:22-27 (describe an example problem when color collision occurs), FIG. 8 (illustrating color collision). Due to color collisions, operations based on BSS colors are no longer allowed since BSS colors cannot be reliably used to perform these operations. The '163 Patent recognizes color collisions. But instead of not performing the BSS color-based operations, the '163 Patent still

performs BSS color-based operations, e.g., by using other techniques that do not use BSS color. *See, e.g.,* '163 Patent at 3:52-59.

Specifically, the patent teaches that, in the event of color collision, operations based on BSS color are carried out by employing parameters different from the BSS color, e.g. MAC address or other RXVECTOR parameters. *See, e.g.,* '163 Patent at Fig. 22, 14:65-15:9, 16:65-17:29.

Representative Claim 1 of the '163 Patent recites the following:

[1.1] A wireless communication terminal communicating wirelessly,  
the wireless communication terminal comprising:

[1.2] a transceiver; and

[1.3] a processor,

[1.4] wherein the processor is configured to receive a physical layer convergence procedure (PLCP) Processing Data Unit (PPDU) by using the transceiver, and not to use a Basic Service Set (BSS) color when signaling information indicates that an operation based on the BSS color is not allowed,

[1.5] wherein the BSS color is an identifier of a BSS,

[1.6] wherein the signaling information is transmitted from a base wireless communication terminal to which the wireless communication terminal is associated.

Independent Claim 9 also recites similar elements as Claim 1.

**A. Overview of the '163 Patent's File History**

In the first Office Action, the examiner found that prior art Noh “teaches ... *not to perform an operation based on a Basic Service Set (BSS) color* when signaling information indicates that operation based on the BSS color is not allowed (figure 1, [0040], not to set an Intra-BSS (NAV) when the BSS color indicated in the HE-SIG-A field does not match the BSS color of the BSS associated with the receiving STA, the receiving STA regards the PPD as an Inter-BSS PPDU).” Ex-1002 at 189. The applicant then amended the claim to change “*not to perform an operation* based on a Basic Service Set (BSS) color” to “*not to use* a Basic Service Set (BSS) color” in the June 4, 2020 office action response. Ex-1002 at 171.

Then, in the September 3, 2020, office action, the examiner agreed that Noh does not teach “not to use a Basic Service Set (BSS) color when signaling information indicates that an operation based on the BSS color is not allowed”, and instead cited Chu. Ex-1002 at 142.

On December 22, 2020, the applicant and the examiner had an interview, and the examiner found that Chu “does not teach ‘not to perform an operation based on a Basic Service Set (BSS) color when signaling information indicates that the operation based on the BSS color is not allowed.’” Ex-1002 at 114.

Then, in the December 28, 2020, office action response, the applicant, in distinguishing Chu, argued that Chu's simple statement that "if the broadcast BSS color is not acceptable" does not teach "not to use a Basic Service Set (BSS) color when signaling information indicates an operation based on the BSS color is not allowed" and "wherein the signaling information is transmitted from a base wireless communication terminal to which the wireless communication terminal is associated." Ex-1002 at 118.

The examiner subsequently allowed the '163 Patent on January 13, 2021. Ex-1002 at 96. In the Notice of Allowance, the Examiner found that the arguments filed on December 28, 2020 are persuasive. Ex-1002 at 96.

### **III. Level of Ordinary Skill in the Art**

The Petition proposes that a POSITA "would have had a Bachelor's degree in electrical engineering, computer engineering, computer science, or a related field, and at least 3 years of experience in the research, design or development of wireless communication devices, systems, and/or networks, or equivalent, as of [March 4, 2016]. Increased education experience can make up for less work experience and vice versa." Petition at 4. To the extent that Petitioner requires that the required experience and/or education level to be acquired by March 4, 2016, Petitioner objects to this requirement because it is not relevant or needed for someone to be a POSITA. Patent Owner does not

otherwise challenge Petitioner's definition for purposes of this Preliminary Response.

#### **IV. Claim Construction**

"Petitioner submits that no formal claim constructions are necessary...."

Petition at 3. Claim construction is currently ongoing in the District Court. Parties have identified terms for constructions in the District Court. For purposes of this Preliminary Response, claim construction is not necessary as Petitioner failed to demonstrate that the prior art discloses the claims. Patent Owner, however, reserves the right to propose constructions of the terms in a later stage.

#### **V. The Petition Failed to Establish "Not [to Use/Using] a Basic Service Set (BSS) Color When Signaling Information Indicates an Operation based on the BSS Color is not Allowed" in all Challenged Claims**

##### **A. Lee (Ex-1005)**

Lee (U.S. Publ. No. 2017/0223731) relates to performing CCA using BSS color. Ex-1005 at Abstract. Lee describes using the BSS color bit to determine whether a signal belongs to the BSS or another BSS (i.e. OBSS). *See, e.g.*, Lee at Abstract; Petition at 6. It changes the CCA level to a first level if the color indicates that the signal belongs to BSS, and changes the CCA to a second level if the color shows that the signal belongs to OBSS. Lee at Abstract; Petition at 6 ("Lee contemplates that different CCA levels may be

applied based on whether a frame is associated with the STA's BSS or another BSS.”).

Lee also defines a coloring disable bit in addition to the BSS color bit, which indicates that the data unit is a trigger frame for a multi-user (e.g., OFDMA) based transmission. Lee at Abstract. A trigger frame can be used for resource allocation in the multi-user OFDMA transmission. “[I]f the coloring disable bit indicates that the frame corresponds to a trigger frame related to multiuser transmission, the STA does not perform the change of the CCA level irrespective of information indicated by the coloring bit.” Lee at [0007].

The Petition points to the coloring disable bit as the claimed “signaling information.” Petition at 12 (“Thus, a POSITA would have understood or found it obvious that Lee’s coloring disable bit in the PPDU’s HE-SIG field is signaling information.”). But the coloring disable bit of Lee indicates that a frame containing that bit is a trigger frame; it does not indicate that “an operation based on the BSS color is not allowed,” as is required by the claims of the ‘163 Patent. Lee at Abstract, [0007]. Indeed, Petition also admits that the coloring disable bit indicates a trigger frame. Petition at 8, *citing* Lee at [0067]-[0068]. In other words, despite being called a “disable bit,” the disclosure of Lee does *not* teach the features recited in the claims of the ’163 patent. The alleged signaling information (i.e., coloring disable bit in Lee)

does not actually indicate that “an operation based on the BSS color is not allowed” and instead indicates a trigger frame. Accordingly, the Petition failed to demonstrate a reasonable likelihood to succeed on the merits.

While the Petition argues that the CCA level change is the claimed “an operation based on the BSS color” (Petition at 13), the Petition failed to show the claimed element of “when signaling information indicates an operation based on the BSS color is *not allowed*.” *See, e.g.*, '163 Patent, Claim 1 (emphasis added). Lee only discloses that the STA does not change CCA levels if the color disabling bit indicates that it is a trigger frame. Lee at [0007] (emphasis added). It does not teach whether changing CCA levels using the BSS color (or whether any operations based on the BSS color) is or is not allowed.

Moreover, the claim recites “*not to use a Basic Service Set (BSS) color* when signaling information indicates an operation based on the BSS color is not allowed.” '163 Patent, Claim 1 (emphasis added). In contrast, in Lee, even if the color disabling bit is received, CCA can still be performed using the BSS color. *See, e.g.*, Lee at [0069] (“If the coloring disable bit indicates that the frame corresponds to a trigger frame related to multiuser transmission, the change of the CCA level can be performed when an uplink frame is received.”). That is, Lee's color disable bit does not cause the system not to use BSS color;

instead, Lee still uses BSS color for a device to recognize whether the data unit is from its own BSS or overlapping BSS (OBSS). Lee at [0012]-[0013] (Lee determines whether to perform transmission in a protection section based on whether the coloring bit indicates the device's associated BSS or an OBSS). The Petition also agrees that Lee still uses BSS color to distinguish between BSS and OBSS. Petition at 13-14, *citing* Lee at [0067] (Lee further explains that a STA checks the coloring bit to determine whether '*the coloring bit indicates a BSS* to which the STA belongs thereto' or '*the coloring bit indicates a BSS* to which the STA does not belong.'") (emphasis in original).

In the end, Lee's method is directed to a different issue from the '163 Patent. Lee is about how to perform CCA using BSS colors or not to perform CCA at all if it is a trigger frame. Lee at Abstract, [0007]. It does not teach performing color-based operations (such as CCA level change) when the colors cannot be used, e.g., in a color collision. Indeed, Lee does not disclose anything remotely relevant to solving color collision issues for devices in multiple BSSs. Nor does Petition's use of an expert declaration fill this gap, as the expert declaration merely parrots the Petition.

**B. Choudhury (Ex-1009)**

Choudhury does not teach the '163 Patent either. While the '163 Patent addresses the problems arising from BSS color collisions, Choudhury is

directed to a different technical problem, namely managing interference in wireless networking environments. Choudhury at 1. Choudhury rests on the 802.11ah standard and proposes to modify the 802.11ah standard. The 802.11ah standard, however, is for a different frequency band and has different technical considerations compared to the '163 Patent, which relates to a Wi-Fi standard. Notably, the 802.11ah standard has been adopted for Internet of Things (IoT) devices operating in the sub-1 GHz band, which contrasts with Wi-Fi standards (such as 802.11ax) that utilize the 2.4 GHz, 5 GHz, and 6 GHz bands. Due to the IoT applications in the sub-1 GHz band, e.g., 900 MHz, with a significantly extended coverage (typically up to 1 km), the 802.11ah standard does not need to consider the BSS color collision issue. As a result, a POSITA would not be looking at Choudhury in attempting to solve the problem in the '163 Patent, which arises from BSS color collisions.

Choudhury provides “mechanisms for managing channel use in ways that assure fairness to low power devices as well as additional more precise ways to manage access in general.” Choudhury at [0016]. Choudhury explains that with the increasingly varied power levels being served by wireless networks, an increased CCA threshold (associated with a high-power device) can lead to lower power level devices suffering interference and unfairness, because “they are unable to be received at the increased CCA threshold and

therefore prevent interfering transmissions from other stations.” Choudhury at [0009].

Choudhury proposes to solve this problem by using a 1-bit indicator called Low Power Bit in the SIG field to indicate whether a device is a low-power device. Choudhury at [0022]. Choudhury proposes an amendment to the previous 802.11ah standard (which described the COLOR field concept) where this Low Power Bit is to be used individually or in combination with the COLOR field to determine whether to allow or limit STAs' access to the channel. Choudhury at [0023], [0026]-[0027].

Choudhury proposes three variant embodiments of its approach:

- First variant: an indicator following the COLOR field described in 802.11ah is accompanied by a low power indicator.
- Second variant: a low power indicator is used without the use of the COLOR field concept.
- Third variant: a modified version of the COLOR field concept is used, without a separate Low Power indicator.

Choudhury at [0024]. None of the three embodiments, however, teaches the '163 Patent.

The Petition argued that the “Low Power / High Interference Indicator” (i.e., the Low Power Bit) and the COLOR field meet the claimed “signaling information.” Petition at 51. But this theory fails because the alleged signaling information does not “indicate[] that an operation based on the BSS color is

not allowed.” Choudhury at [0023]. The Low Power Bit is “an indication that a device is operating at low power or is otherwise unusually susceptible to interference or is experiencing interference.” Choudhury at [0023]. It does not indicate that “an operation based on the BSS color is not allowed” as required by the claims. Instead, the BSS color field indicates whether the data unit is in the same BSS—the basic feature of prior art uses of the BSS color concept. Choudary at [0021] (“Each BSS has a different color [field] that enables STA to know (with high probability) whether the transmission is within their BSS or not after decoding the SIG field.”).

The table cited in the Petition (reproduced below) does not help the Petitioner either.

COLOR Field	Low Power/High Interference Indicator	Receiving STA
Not used	1	Limit Access
Not used	0	Allow Access
STA in same BSS (that is, same COLOR field as receiving STA)	0 or 1	Limit Access
STA in different BSS (different COLOR field from receiving STA)	0	Allow Access
STA in different BSS (different COLOR field from receiving STA)	1	Limit Access

Choudhury at [0029]; Petition at 52. The rows 1-2 of the table demonstrate the second variant in Choudhury, where “a low power indicator is used without the use of the COLOR field concept.” Choudhury at [0024]. Here, “a low power indicator is used to indicate all other STAs that they should refrain

from using the channel if they are able to decode the SIG field.” Choudhury at [0028]. In other words, the lower power indicator of Choudhury (and in particular as shown in rows 1-2) is not for indicating whether *an operation based on the BSS color* is allowed or not allowed, as required by the claims.

Rows 3-5 of the table demonstrate the first variant of Choudhury where “an indicator following the COLOR field concept described in 802.11ah, may include or be accompanied by a lower power indicator.” Choudhury at [0023]. Accordingly, Choudhury uses the COLOR field in these rows to determine whether the data unit is in the same BSS, which runs directly afoul of the claim language of “*not to use a Basic Service Set (BSS) color* when signaling information indicates that an operation based on the BSS color is not allowed.” *See, e.g.,* ’163 Patent, Claim 1 (emphasis added).

Specifically, in the third row of the table, the Low Power bit indicator is essentially irrelevant, as it can be set to either 0 or 1, since the behavior of the receiving STA is determined solely by the COLOR field. Based on the COLOR field value, if there is an ongoing intra-BSS transmission, the STA does not re-use the channel. Choudhury at [0025]. Thus, in the third row of the table, Choudhury still uses the BSS color, which contravenes the claim’s requirement of “not to use a Basic Service Set (BSS) color.”

As to the fourth and fifth rows, the COLOR field is still used, to determine whether a data unit is from OBSS. If it is from OBSS, the STA avoids transmitting or applies a lower CCA threshold if the SIG field also includes a Low Power indicator bit set to 1 (as indicated in the fifth row of the table). But if it is from OBSS and if the Low Power bit is set to 0, the STA may access the channel without any restriction (as indicated in the fourth row of the table).

Thus, the first variant of Choudhury teaches using both the COLOR field and the Low Power indicator in the SIG field to determine if a STA monitoring the signal field is allowed to access the channel or needs deferred channel access. Choudhury at [0026]. It does not teach “*not to use a Basic Service Set (BSS) color*” in the claims of the '163 Patent.

The Petitioner also points to the value “0000” in the COLOR field in the third variant of Choudhury. Petition at 54-55. But this third variant of Choudhury still uses the COLOR field. Choudhury at [0024] (“In a third variant, a modified version of the COLOR field concept is used, without a separate low power indicator.”). Indeed, Choudhury describes that “the first three bits of the COLOR bit can be used to set the basic service set identification (BSS ID) and the fourth bit can be used as a low power/high access.” Choudhury at [0029]. Again, this shows that the COLOR is still used,

i.e., to determine whether the data unit is in the same BSS in the first three bits along with an indication of whether the device is low power.

Choudhury also discloses that the entire 4-bit COLOR field can be used to express whether it is low power or high interference devices, where “1111 may be used for low power devices or 0000 may be used for high interference devices.” Choudhury at [0029]. Here, contrary to the Petition (Petition at 55), the 0000 in Choudhury does not indicate “an operation based on the BSS color is not allowed” as required in the claim; instead, it indicates whether it is a lower power or a high interference device. Choudhury at [0029].

According to Choudhury, a receiving station is configured to receive a PPDU and to apply some limitations to the channel access, such as a lower CCA threshold or inhibition to the channel use, to avoid interference when the “Low Power/High Interference Indicator or the COLOR ‘0000’ value of the received PPDU indicates that the device is susceptible to interference. Choudhury at [0030]. Because the “Low Power/High Interference Indicator or the COLOR’ ‘0000’ value does not indicate that “an operation based on the BSS color is not allowed”, it would not have been obvious to a POSITA not using the BSS color based on said signaling information.

## VI. Conclusion

For the foregoing reasons, the Petition fails to demonstrate at least the element of “not [to use/using] a Basic Service Set (BSS) color when signaling information indicates that an operation based on the BSS color is not allowed” of independent Claims 1 and 9 is present in the prior art that the Petition relies upon for this limitation. Accordingly, the Petition fails to establish that it has a reasonable likelihood to succeed on the merits, and it should not be instituted.

Dated: September 2, 2025

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**CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. § 42.24**

I certify that there are 3,764 words in this paper, excluding the portions exempted under 37 C.F.R. § 42.24(a)(1), according to the word count tool in Microsoft Word.

Dated: September 2, 2025

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**CERTIFICATE OF SERVICE**

I hereby certify that "Patent Owner's Preliminary Response" was served on September 2, 2025 by email sent to:

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