IEEE P802.11
Wireless LANs

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| LC MIMO |
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| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Robert Stacey | Intel |  |  | Robert.stacey@intel.com |
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Abstract

Comment resolution for SA ballot on P802.11bb/ D4.1

# Revision History

# Discussion

The LC architecture for supporting MIMO is not well described. Also, it is not clear that MIMO is supported through two techniques: wavelength division multiplexing and spatial division multiplexing.

# Editing instructions

**TGbb editor: Insert the following:**

**32.3.5 Multiple transmit chains and multiple receive chains**

***TGbb editor: Insert the following as the first paragraph:***

The LC PHY may use multiple transmit chains and multiple receive chains to support wave division multiplexing and/or spatial division multiplexing.

Spatial multiplexing is supported when the LC optical RX antennas and LC optical TX antennas are positioned such that light transmitted by an LC optical TX antenna and incident on an LC optical RX antenna is isolated from the light transmitted by another LC optical TX antenna that is incident on another LC optical RX antenna. The isolation might be achieved by directing the light at the optical TX antenna or capturing light from a particular direction at the optical RX antenna. The isolation might also be achieved by spatially separating the LC optical TX antennas and/or LC optical RX antennas. This principle is illustrated in Figure X.



Figure X – Spatial multiplexing with an LC PHY

Wave division multiplexing is supported when the wavelenth of the light transmitted by one LC optical TX antenna is different from the wavelength of light transmitted by another LC optical TX antenna and, correspondingly, one LC optical RX antenna is sensitive to light of the first wavelength but not the second wavelength and another LC optical RX antenna is sensitive to light of the second wavength but not the first wavelength. This principle is illustrated in Figure Y.



Figure Y – Wave division multiplexing with an LC PHY

In the above description, if the LC optical TX antennas are in one LC PHY and the LC optical RX antennas are in another LC PHY the arrangement supports SU-MIMO. If the LC optical antennas (TX or RX) at one end are in the same LC PHY but the LC optical antennas (RX or TX) at the other end are in different LC PHYs then the arrangmenet supports MU-MIMO.

An LC optical RX antenna shall be sensitive to light in one of the following wavelength ranges:

* 800 nm to 900 nm
* 900 nm to 1000 nm
* 800 nm to 1000 nm

An LC PHY shall have at least one receive chain with an LC optical RX antenna sensitive to light in the 800 nm to 1000 nm range or at least two receive chains with one receive chain with an LC optical RX antenna sensitive to light in the 800 nm to 900 nm range and the other receive chain with an LC optical RX antenna sensitive to light in the 900 nm to 1000 nm range.

The maximum number of spatial streams supported by an LC PHY using wave division multiplexing is 2.

**32.3.5a Receive specification**

The minimum receive sensitivity of an LC PHY shall be -32 dBm\_opt measured as the average incident power in the range 800 to 1000 nm at the LC optical RX antennas.

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