

Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Ring-like radiation enhancement phenomenon of inhomogeneous plasma layer coated metallic antenna. WENQIU LI, Princeton Plasma Physics Laboratory — Radiation enhancement phenomenon of a thin inhomogeneous plasma layer covered metal antenna can be observed by optimizing the plasma density and electron temperature for giving antenna–plasma layer configuration. Based on the collisional plasma assumption, theoretical results obtained by solving the eigenmode dispersion relation of symmetric waves propagating along the antenna–plasma layer interface indicate that, when the wave frequency is 1 GHz, the radius of the metal antenna is 3 times of the plasma skin depth, and the thickness of the sheath is about one tenth of the thickness of the main plasma layer, there is a ring-like radiation enhancement phenomenon where the plasma frequency is about 1.4 times of the wave frequency. This radiation enhancement phenomenon may induced by the impedance resonance of the antenna-plasma layer configuration, and which may have great potential in radio frequency antenna communication.

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Date submitted: 27 Jun 2020

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