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RF plasma heating improvement with EBG surfaces SAUL GUADAMUZ, DANIELE MILANESIO, RICCARDO MAGGIORA, Politecnico di Torino — High impedance surfaces or electromagnetic band gap (EBG) surfaces have proved themselves to be useful in wireless communications applications due to their unique characteristics such as no propagating surface wave support, no conduction of RF current for a given bandwidth, in-phase electromagnetic reflection and non-inverted image of the electric charge in front of them [1]. These characteristics make possible to design compact antennas achieving better performance in terms of radiation and input impedance. ICRF plasma heating antennas in fusion experiments can take advantage of using EBG surfaces. One of the main issues in ICRF plasma heating is the low power coupling of the plasma facing antenna. The adoption of EBG surfaces in the antenna structure and the advantages offered by a predictive designing tool as TOPICA [2] offer the possibility to improve significantly the coupled power to plasma. [1] IEEE Trans. Microwave Theory Tech., vol. **47**, pp. 2059–2074, Nov. 1999. [2] Nucl. Fusion, **46** (2006) S476.

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