LH launcher Arcs Formation and Detection on JET.

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Mechanisms of arc formation have been analyzed and the critical electric fields for the multipactor effect calculated, compared to the experimental values and found to be within the normal operational space of the LH system on JET. It has been shown that the characteristic electron energy (100-1000)eV for the highest multipactor resonances (N=4-9) are within the limits of secondary electron yield above 1 required for multipactoring. Electrons with these energies provide the highest gas desorption efficiency when hitting the waveguide walls. The effect of higher waveguide modes and magnetic field on the multipactor was also considered. The distribution function for electrons accelerated by LH waves in front of the launcher has been calculated. The field emission currents have been estimated and found to be small. The emission of Fe15,16 lines obtained with improved diagnostics are proposed for use in detecting arcs unstopped by the protection system based on the reflected power. The reliability and time response of these signals are discussed. Similar technique based on the observation of the emission of low ionized atoms can be used for a fast detection of other undesirable events causing sputtering or melting of the plasma facing components such as RF antenna. It might be especially useful if the emission can be uniquely associated with specific parts of the components.

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*See the Appendix of F. Romanelli et al., Proceedings of the 23rd IAEA FEC 2010, Daejeon, Korea