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Effect of linearly and elliptically polarized electric fields on multipactor discharges[1] DE-QI WEN, YANGYANG FU, JANEZ KREK, PENG ZHANG, JOHN. P VERBONCOEUR, Michigan State Univ — It is well known that energetic electrons hitting material surfaces induce secondary electron emissions. When the electron emission coefficient is larger than unity, multipactor discharge develops, and the electron density increases and then reaches saturation. This process may negatively affect the electromagnetic wave transmission, especially in high power microwave devices. In the current work, we consider the effect of linearly and elliptically polarized electric fields on multipactor discharges for the first time. The rf electric field normal to the dielectric window surface is self-consistently generated with an external RLC circuit, and the rf electric field parallel to the surface is externally applied. Thus the total electric field can be linearly or elliptically polarized. By adjusting the angle between the linearly polarized field and the normal direction, as well as the ratio of the ellipse's short and long half axes, the temporal evolutions of the multipactor discharge characteristics, such as space charge effect, electron density, electron energy distribution functions (EEDFs), are detailed by a one-dimensional PIC/MCC (1d3v) simulation.

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