Contribution ID: **793** Type: **Oral**

Simulations of transient multipactor suppression due to dielectric surface charging

Friday 28 June 2019 16:15 (15 minutes)

Multipactor breakdown occurs in vacuum when RF fields cause a growth of electrons as primary electrons impact various surfaces to generate multiple secondary electrons. On dielectric surfaces, this can lead to charge build up as electron-holes accumulate. This charge accumulation affects the field structure near the dielectric surface, which may then alter or suppress a nascent multipactor breakdown and limit the ability to detect these events. To understand this process, we have used a new Systematic Multipactor Research Tool (SMRT) developed at The Aerospace Corporation. This modularity of our new tool allows us to simulate various geometries and surface types, alter secondary yield behaviors, track surface charge accumulation, and solve space-charge fields. In this work, we simulate breakdown on a two-surface stripline while including space-charge and surface-charge effects. With only conducting surfaces present, the multipactor breakdown will grow until it saturates due to space-charge limitations. However, when one or two of the surfaces are given dielectric properties, a steady-state electric field develops that can limit and suppress the growing breakdown. By including these surface charging effects, we can simulate the maximum electron population as well as the timescale of the transient multipactor event.

Author: FELDMAN, Matthew (The Aerospace Corporation)

Co-authors: Dr HUBBLE, Aimee (The Aerospace Corporation); Dr SPEKTOR, Rostislav (The Aerospace Corporation); Mr RONGIONE, Nicolas (The Aerospace Corporation); Mr PARTRIDGE, Preston (The Aerospace Corporation)

Presenter: FELDMAN, Matthew (The Aerospace Corporation)

Session Classification: 1.1 Basic Phenomena III

Track Classification: 1.1 Basic Phenomena;