

## Material Contrast from Ga<sup>+</sup> Ion Induced Secondary Electron Images

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The relative contrast of Ga<sup>+</sup> focused ion beam (FIB) induced secondary electron (ISE) images in metal layers show non-monotonic behavior as a function of target atomic number which is consistent with non-monotonic ion-solid interaction characteristics observed across the periodic table. The emission of secondary electrons (SEs) by Ga<sup>+</sup> FIB imaging is dominated by the kinetic emission mechanism which can be characterized by (i) creation of the SE's due to a) direct ion-solid collisions, b) recoil collisions, and c) SE-electron collisions; (ii) diffusion of the SE's to the target surface; and (iii) escape of the SE's from the surface. The stopping power will determine how many electrons are generated in close proximity to the surface for easy escape. However, it is also shown, that the sputter yield must be accounted for, because a moving surface can reduce the diffusion length for SEs to escape, and therefore, enhance the observed SE yield (i.e., contrast).