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Charging and transmission of low energy particles through Amorphous Solid Water films YONATAN HOROWITZ, MICHA ASSCHER, Institute of Chemistry, Edmund J. Safra Campus, Givat-Ram, The Hebrew University of Jerusalem, Israel — The interaction of charged particles with condensed water films has drawn significant attention in recent years due to its importance in biological and atmospheric processes. We have studied low energy electrons (3-25 eV) and positive argon ions (55 eV) charging and transmission effects while striking Amorphous Solid Water (ASW) films, 240-1080 ML thick, deposited on ruthenium single crystal substrate, utilizing contact potential difference (CPD) measurements. Charging by both species has shown a plate capacitor-like behaviour. L-defects energetically located just below the conduction band of ice, are likely to stabilize them. The incoming electrons kinetic energy dictates the maximal CPD by retardation of any further electrons from adding up to the already accumulated charges. Electron transmission measurements (0.5-1.5 microamps) have shown that the maximal and stable CPD values were obtained only following a relatively slow change that has developed within the ASW structure. Upon film stabilization, the spontaneous discharge was measured over a period of up to three hours. UV laser photo-emission study of the charged films has suggested that the negative charges tend to reside primarily at the ASW-vacuum interface, in good agreement with a study of charged water nano-clusters.

Yonatan Horowitz
The Hebrew University of Jerusalem

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