

## **SESSION: SWARM, ePOP**

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### **Plasma density depletion and ion flow perturbation during the solar eclipse**

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During the August 21, 2017 solar eclipse over North America, the Enhanced Polar Outflow Probe (e-POP) traversed the path of totality at ~640 km altitude over Idaho at 17:37 UT within ~10 minutes of totality, which provided a unique vantage point for observing several significant effects of the eclipse on the topside ionosphere. We present observations from Swarm-E (e-POP) during the eclipse showing: (1) a factor-of-two decrease in the topside plasma density; (2) a concurrent and significant (~50%) drop in only the upward H<sup>+</sup> ion flux that was not accompanied by a corresponding drop in downward flux; (3) a medium-scale traveling ionospheric disturbances (TID) resulting from the eclipse of about 0.2 total electron content unit in amplitude, and (4) a distinct reduction in radio absorption in the eclipsed ionosphere relative to non-eclipse ionosphere. These observations are attributed to the temporary cessation or reduction of photoionization in the F-region over the umbra and penumbra regions as the moon's shadow and the resulting maximum solar obscuration moves at supersonic speed across the continent.