

Canadian Association of Physicists Division of Atmospheric and Space Physics
Annual Workshop 18-21 February 2020, Fredericton, NB Canada

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CASSIOPE e-POP: New Studies and Recent Results on Magnetosphere-Ionosphere Coupling
under the Swarm-E Banner

The CASSIOPE Enhanced Polar Outflow Probe (e-POP) was originally envisioned as a low-cost, short-lifetime (18-month) small-satellite mission for investigating polar ion outflows and related auroral phenomena. However, e-POP is currently in its seventh year of continuing operation, as an addition to (and the fourth component of) the Swarm constellation of satellites, thanks to new funding from the European Space Agency as a Third Party Mission.

Since 2017, the increased operation duty-cycle of e-POP has enabled the routine extension of its science operations to all altitudes and latitudes, and made possible several new studies of important mid- and low-latitude phenomena. In addition, the integrated e-POP and Swarm operation has enabled or enhanced a host of coordinated studies of magnetosphere-ionosphere coupling (MIC), including the Earth's magnetic field and related current systems, upper atmospheric dynamics, auroral dynamics, and related coupling processes among the magnetosphere, ionosphere, thermosphere, and plasmasphere.

We present an overview of these new investigations, focusing in particular on new recent results from these investigations and on those of particular interests to the DASP community.

magnetosphere-ionosphere coupling; upper atmosphere; aurora