



## **Properties and behaviour of FAC currents in the inner magnetosphere**

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Cusp, region 1 and 2, and other large scale field-aligned currents (FACs), are sampled in situ by both the four Cluster spacecraft and by the three Swarm spacecraft at different altitudes, separated by a few to several Earth radii, and sometimes simultaneously. Here, the capability of Swarm-Cluster coordination for probing the behaviour of the field aligned currents (FACs) at medium and low orbits is explored. Joint signatures of R1 and R2 FACs (as well as cusp, R0 and NBZ currents) can be found and compared in terms of the magnetic signatures, using multi-spacecraft analysis where possible. Using the Swarm configuration, statistical correlation analysis of the local time variation of R1/R2 FACs can be shown and compared to standard MVA analysis. For context, we identify the associated auroral boundaries through application of a method to determine the FAC intensity gradients in order to interpret and resolve the R1 and R2 FACs. We also explore the relation of R2 FACs to the ring current properties measured in situ.