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FAST Observations of Field-Aligned Currents in the THEMIS era

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The FAST spacecraft has acquired low altitude magnetic field observations for over a decade. Recently, with the installation of the THEMIS ground magnetometer network, and the launch of the THEMIS spacecraft we are able to place the FAST observations in a more global context. Here we present FAST observations during the first three tail seasons of the THEMIS mission, and compare the field-aligned current structure at low altitudes with the drivers of the currents as observed by THEMIS. We will emphasize that the currents can be highly structured at low altitudes. In particular, the currents correspond to flows within the ionosphere, while in the magnetosphere, the currents are driven by changes in vorticity or pressure gradients. Understanding how the magnetospheric drivers map to the ionospheric flows can be aided by numerical simulations