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Low-latitude magnetic disturbances caused by field-aligned currents connected to the polar ionosphere

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We investigate the long distance effect of the polar region field-aligned currents (FAC). In spite of their mutual shielding effect these currents cause significant magnetic disturbances at mid- and low latitudes. Based on a statistical determination of the FAC-pattern we investigate their associated magnetic perturbation at mid- and low latitudes. The computed perturbation is compared with both satellite and ground-based observations and their dependence on the interplanetary magnetic field. Our results indicate that the long-distance effect based on the statistical model can explain the mid-and low latitude observations.