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Universal Time variations in the magnetosphere

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Universal Time variations have long been known in the AE(12) auroral electrojet indices and have generally been attributed to longitudinal structure in the ring of 12 AE geomagnetic observatories. Such problems are even more extreme in equivalent indices from more extensive networks of magnetometers because of the lack of stations in the great oceans. However, this explanation may have masked a real UT variation in the magnetosphere. We present evidence for a UT variation in the transpolar voltage, as derived for both polar caps using the SuperDARN radars with the matched potential technique and from a statistical survey of polar orbiting satellite data. The results are consistent with a UT dependence in the b2i tail stretching index. We suggest that reconnection in the magnetotail is supressed at certain UT by the longitudinal warp of the near-Earth edge of the cross-tail current giving reduced transpolar voltage and enhanced tail stretching at such times. However, not everything fits with this interpretation: a survey of the open flux from global FUV images did not find a corresponding rise at the relevant UT.