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Dayside reconnection under IMF By dominated conditions: the formation and movement of bending arcs

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Based upon a survey of global auroral images collected by the Polar UVI instrument, Kullen et al. 2002 subdivided polar cap auroral arcs into a number of categories, including that of 'bending' arcs. We are concerned with those bending arcs that appear as a bifurcation of the dayside auroral oval, and which subsequently form a spur intruding into the polar cap. Once formed the spur moves polewards and antisunwards over the lifetime of the arc. We propose that dayside bending arcs are ionospheric signatures of pulsed dayside reconnection, and are therefore part of a group of transient phenomena associated with flux transfer events. We observe the formation and subsequent motion of a bending arc across the polar cap during a 30 minute interval on 8 January 1999, and we show that this example is consistent with the proposed model. We quantify the motion of the arc, and find it to be commensurate with the convection flows observed by both ground-based radar observations and space-based particle flow measurements. In addition, precipitating particles coincident with the arc appear to occur along open field lines, lending further support to the model.