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Polar cap convection events and electrojet intensifications in substorms/pseudobreakups

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We report an investigation of the association between polar cap convection events and electrojet intensifications in substorms/pseudobreakups. The data basis consists of three cases of ground- and satellite observations in the 1500-2000 MLT sector. We take advantage of the good latitudinal coverage in the polar cap and in the auroral zone of the IMAGE chain of ground magnetometers in Svalbard - Scandinavia - Russia. Two of the events were obtained during strong solar wind forcing of the magnetosphere at the time of the Earth passage of interplanetary CMEs. In all three cases we focus on the temporal evolution of polar cap convection in relation to electrojet intensifications in substorms/pseudobreakups. Based on these and previous observations we suggest an evolution of the magnetosphere-ionosphere system initiated by transient magnetopause reconnection which includes the following elements: plasma flow enhancements on open field lines in two consecutive stages (dayside and polar cap), followed by plasma sheet thinning, current sheet disruption, bursty bulk flows (BBFs) and poleward boundary intensification (PBI) in the nightside aurora, accompanied by intensification of the westward electrojet (WEJ). In this study we emphasize the role of 10-min-long events of enhanced momentum transfer to the polar cap ionosphere in the stage of old open field lines as a precursor activity for electrojet intensifications in substorms/pseudobreakups.