

ICESTAR: PI1B PULSATIONS AND THEIR ASSOCIATION WITH SUBSTORM ONSET

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Ground-based observations have shown that Pi1B magnetic pulsations, characterized by broadband bursts in the ULF range (periods of 1 to 40 s), have been well-correlated with substorm onsets. Recent work shows that these are also observed at geosynchronous orbit in conjunction with onset, where they are compressional in nature. Similar characteristics are found on the ground in the cusp region. The fact that these signatures are observed at times and locations where reconnection is often thought to occur raises the question of whether these pulsations may be artefacts of the reconnection process. Studies have shown that these pulsations provide an onset signature with timing precision on the order of a few seconds and, also, that the ground stations that detect this signature need only be located within a couple of hours in MLT of the onset. In this study, observations at nominally conjugate stations (South Pole and Iqaluit) are used to determine differences in substorm onsets in opposite hemispheres. This statistical study spanning two years shows a wide range in onset time differences. For periods of perhaps a few months, however, there are times when onset does occur preferentially in one hemisphere. These features imply that these pulsations may provide new insight regarding Pi1B wave source and propagation mechanisms in association with substorm onsets in opposite hemispheres.