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What is the role of substorms during the development of the ring current?

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In this paper we present results from a comprehensive statistical study of the role of substorms in the development of the ring current. We have identified 80 storms from the years 1996-2003 for which the magnitude of the SuperMAG ring current index, SMR, exceeds 50 nT. Auroral substorms are identified using Polar VIS images, IMAGE FUV images and SuperMAG SME indices. The storm time is normalized by defining onset as T=0.0 and peak as T=1.0 and each auroral substorm is placed on this normalized time axis. We note the exact timing of the substorms relative to the storm main phase, their magnitude as measured by SME and their location in magnetic latitude and magnetic local time. As we question the role of substorms for the development of the ring current we only include substorms occurring in the storm main phase. We question whether substorms are required but not sufficient to develop the ring current or if substorms are not required at all.