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Title: The Consequences of Major Flare Production in Solar Active Regions

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Abstract:

Using the flare database from the GOES Full-Sun X-ray satellite, we have constructed a comprehensive study of the distribution and flare productivity of solar active regions from 1976 to the present. We concentrate on those active regions which produce a number of large flares ( $>$  GOES X-ray class M5) and investigate whether the activity in one active region has consequences for neighboring active regions through large scale magnetic interconnectivity. In certain cases, when two or more active regions are present on the solar disk, a pattern emerges in which the period of large flare production only occurs in one active region at a time. Although this pattern is not always observed, the cases in which this does occur suggest some physical correspondence between active regions. To explore this phenomenon, we have begun to address three distinct questions: how prevalent is this pattern of activity and under what conditions is it upheld or broken?; how is the interaction between active regions manifested in the emission characteristics of the active regions?; and how does the global solar corona respond to the production of these large flares?