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High energetic solar flares during the declining phases of solar cycles

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This study is concerned with the occurrence of high energetic solar X-ray flares (X-type) in relation to solar cycle's phases and the state of the active regions producing them. Comparison between the productions of X-flares (X≥9) at different phases of solar cycles (21, 22 and 23) indicates maximum productivity at the declining phases with the exception of cycle 22 where the climax is at maximum phase. The active region productivity of X-flares is in coherence with the number of days of (β - γ – δ) magnetic field. The active regions energies are consumed in the acceleration of protons and production of X-flares among other things (e.g. CME lifting up). The higher the energy of X-flares the lower the proton flux (pfu @ >10MeV) and vice versa.

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