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Signal processing for the automatic detection of flare events in the Soft-X GOES signal in the period 1986-2020

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An automatic algorithm has been used for detection of flares in the GOES data in the period 1986-2020. The detection process starts from soft-X solar signal, provided by the NASA-GOES Satellite Network which is devoted to the surveillance of the Earth. Since flares represent one of the main events associated with Space Weather their statistics are of particular importance in this context.

The algorithm produced a database, tested with official catalogs for validation, that increased the number of detected flares by a factor of about four compared to the official GOES catalog.

In particular, the problems connected to the soft-X background flux in pre-flare conditions, multiple flares and lower intensity flares were dealt with.

In addition to briefly presenting the algorithm, we show the results of the analysis of the distributions in the last four solar cycles.

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Primary authors: PLUTINO, Nicola (Dipartimento di Fisica - Università di Roma Tor Vergata); BERRILLI, Francesco (Istituto Nazionale di Astrofisica (INAF)); Dr DEL MORO, Dario; LUCA, Giovannelli (Dipartimento di Fisica - Università di Roma Tor Vergata)

Presenter: PLUTINO, Nicola (Dipartimento di Fisica - Università di Roma Tor Vergata)

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