Geophysical Research Abstracts, Vol. 7, 08437, 2005
SRef-ID: 1607-7962/gra/EGU05-A-08437

Reconstructing the solar EUV spectrum from a small set of spectral lines

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The solar EUV flux is a key quantity for studying solar-terrestrial interactions. Difficulties in continuously measuring the calibrated spectrum has led to a widespread use of proxies instead, whose results are often far from being satisfactory.

We consider a different approach, in which the full EUV spectrum is reconstructed from the measurement of a few, carefully selected spectral lines. Using a statistical approach based on classification techniques, and physical criteria, we propose a basic set of 14 lines, from which all the salient features of the spectrum between 26 and 194 nm can be reconstructed with high accuracy. The best results are achieved with a selection of 5 to 9 of these lines.