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All that is known about Mars discrete aurorae so far

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The discrete aurorae on Mars were discovered with the SPICAM spectrograph on board Mars Express. Now, they have been analyzed in detail using the much more sensitive MAVEN/IUVS imaging spectrograph.

This presentation gives a summary of the very latest results obtained by Schneider et al. and Soret et al. on this topic.

The main conclusions are the following:

- the number of auroral event detections has considerably increased since the Mars Express observations;
- many detections have been made outside of the Southern crustal magnetic field structures;
- the MUV spectrum shows the same emissions as those observed in the dayglow, with similar intensity ratios;
- the Vegard-Kaplan bands of N₂ have been observed for the first time in the Martian aurora;
- the CO Cameron and the CO₂⁺ UVD emissions occur at the same altitude;
- the OI emission at 297.2 nm has been analyzed;
- the CO Cameron/CO₂⁺ UVD ratio is quasi-constant;
- intensities are higher in B-field regions;
- auroral emissions are more frequent in the pre-midnight sector;
- the altitude of the emission layer is independent of local time and presence or absence of a crustal magnetic field;
- the altitude of the emission layer varies moderately with season (atmospheric effect);
- the events are spatially correlated with an increase in the flux of energetic electrons simultaneously measured by the MAVEN/SWEA (Solar Wind Electron Analyzer) detectors;
- the peak altitude of the emission is in good agreement with that expected from the average electron energy.