

Comparison of Ionospheric Observations and Dynamical Predictions of Meteor Showers at Mars

We identify ionospheric profiles from Mars that contain features attributable to meteoroid influx

We find intervals when there are many of these profiles and call them meteor showers

We study cometary orbits to identify the parent bodies responsible for the meteor showers

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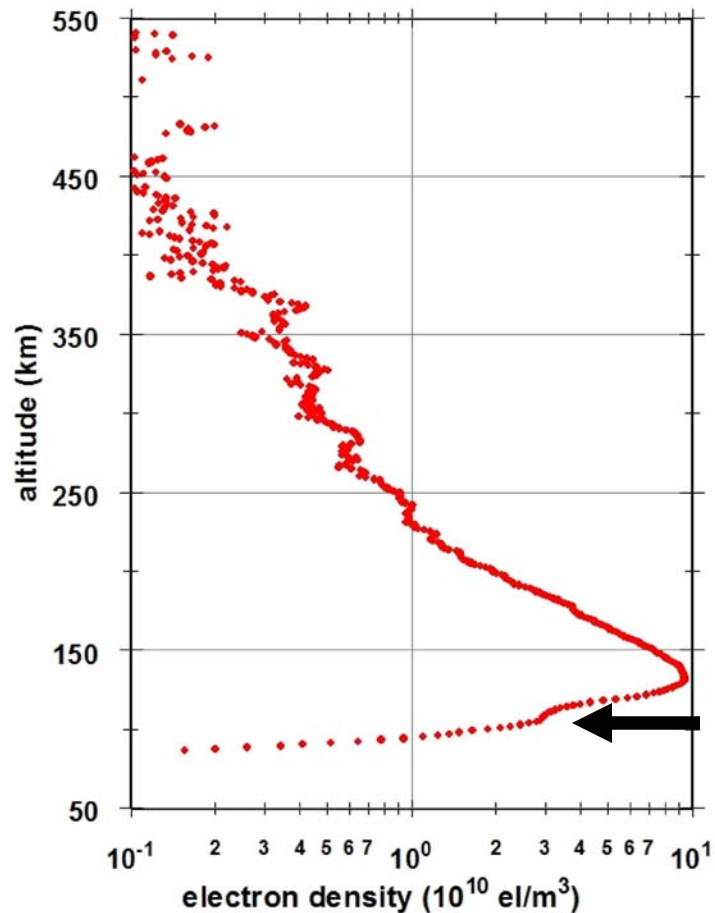
1 – Boston University, 2 – University of Cologne, 3 – Armagh Observatory, 4 – IMCCE, Observatoire de Paris

Abstract 59.08

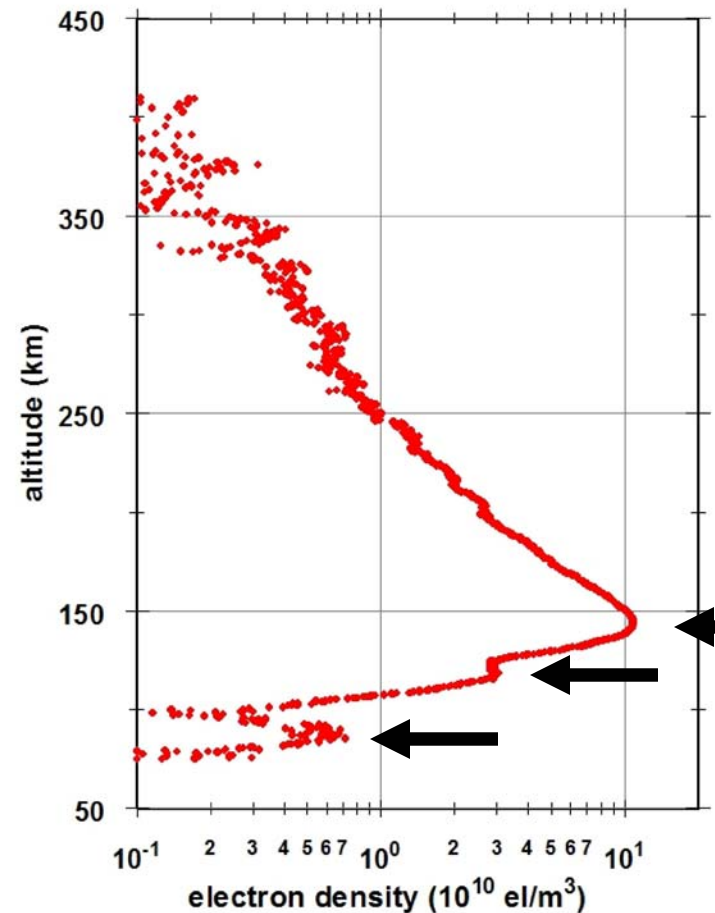
Friday 2007.10.12 09:40-09:50

DPS Meeting 2007, Orlando, Florida

Meteoric Layers (MEX)

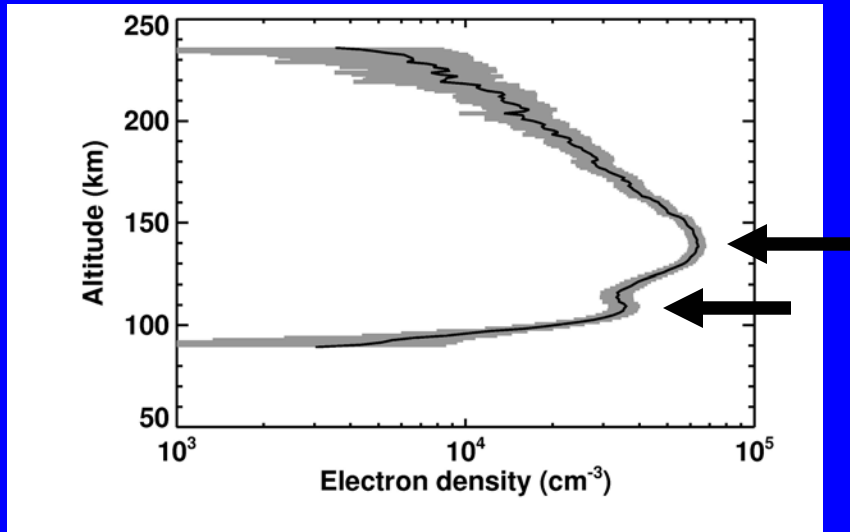


Profile with EUV and X-ray layers only

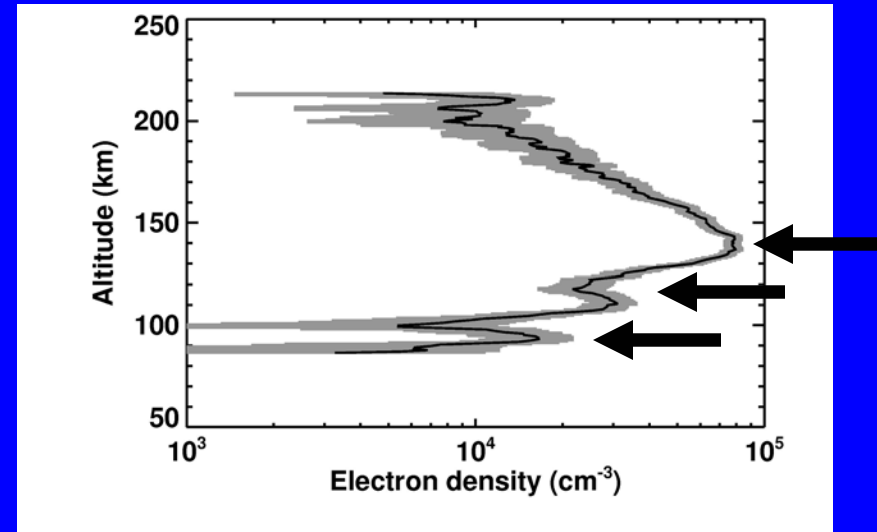


Profile with EUV, X-ray, and meteoric layers

Meteoric Layers (MGS)



Profile with EUV and X-ray layers only



Profile with EUV, X-ray, and meteoric layers

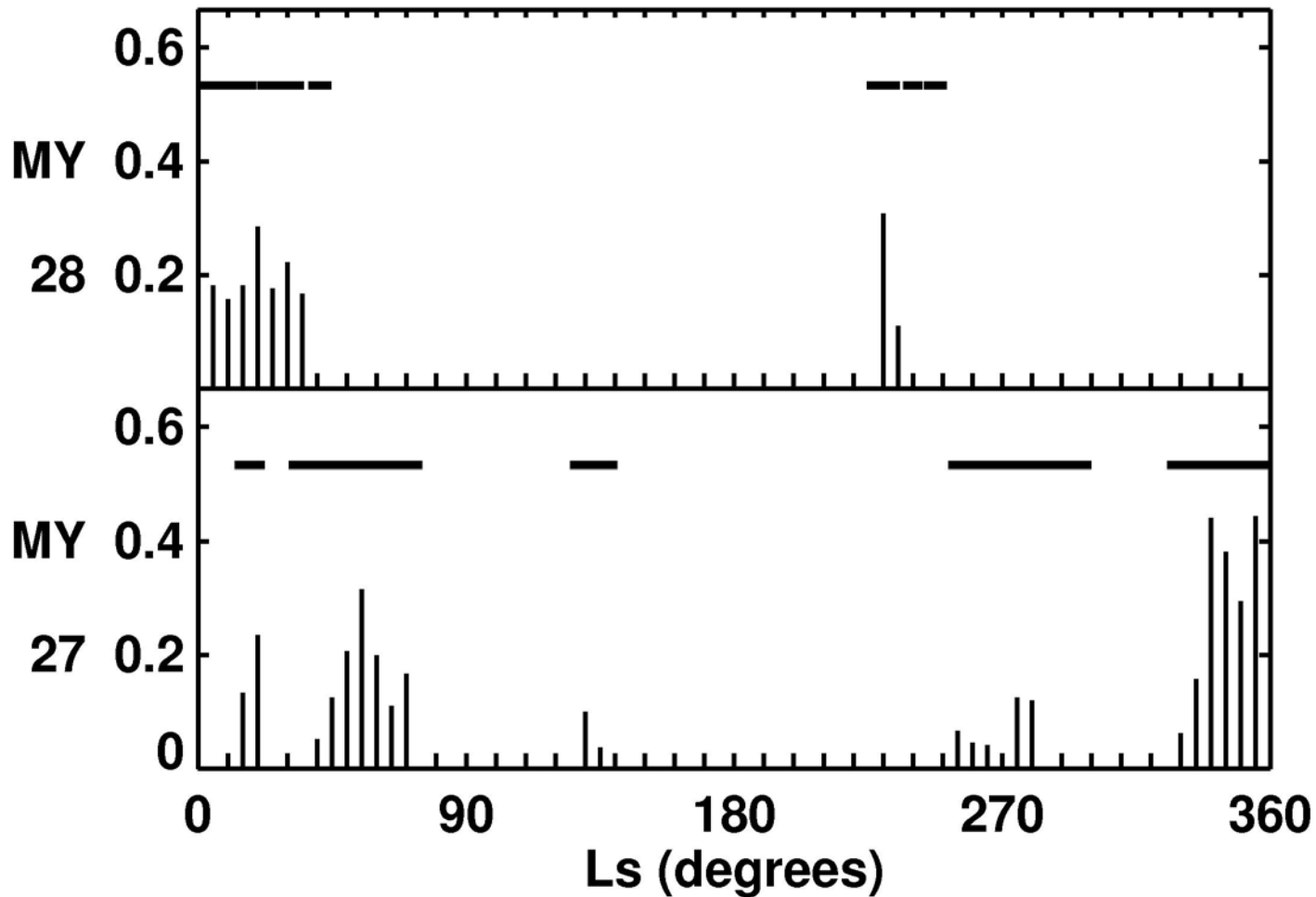
Meteoric layers identified in 71 of 5600 (1.3%) MGS profiles

Meteoric layers identified in 75 of 465 (16.1%) MEX profiles

Differences due to (A) Greater measurement uncertainties for MGS and (B) Possible termination of MGS profiles during processing at ~90 km above the meteoric layer

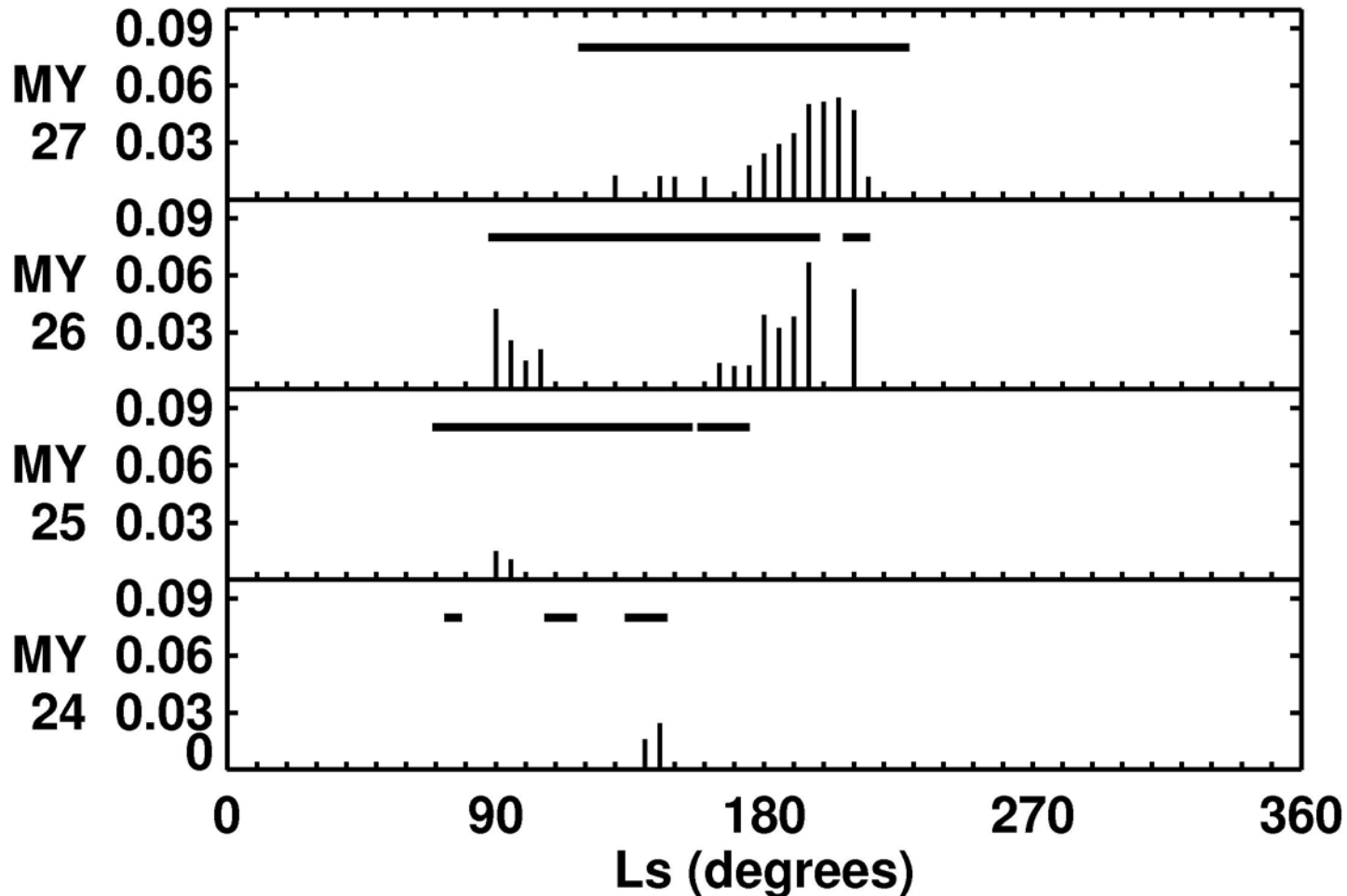
Seasonal Distribution of Meteoric Layers (MEX)

Plot shows ratio of number of profiles with meteoric layers to total number of profiles



Seasonal Distribution of Meteoric Layers (MGS)

Plot shows ratio of number of profiles with meteoric layers to total number of profiles



Observed Ls (degrees)	Predicted Ls (degrees)	Candidate
15-25	15.2	25D
	19.3	85P
	23.8	148P
25-35	N/A	N/A
50-60	N/A	N/A
85-95	90.4	45P
175-185	176.1	79P
	176.4	88P
190-200	190.6	(2102) Tantalus
	198.7	107P

Observed Ls (degrees)	Predicted Ls (degrees)	Candidate
205-215	211.7	15P
	213.0	37P
225-235	227.3	D/ Haneda-Campos
335-345	340.2	C/1998 U5
	343.9	144P
350-360	352.1	24P
	357.8	38P
	359.3	15P

Observed Ls (degrees)	Predicted Ls (degrees)	Candidate	Min distance (AU)	P (yrs)
15-25	15.2	25D/Neujmin 2	0.0303	5.43
	19.3	85P/Boethin	0.0935	11.06
	23.8	148P/Anderson-LINEAR	0.0954	7.05
25-35, 50-60	N/A	N/A	N/A	N/A
85-95	90.4	45P/Honda-Mrkos-Pajdusakova	0.0795	5.26
175-185	176.1	79P/du Toit-Hartley	0.0318	5.28
	176.4	88P/Howell	0.0220	5.50
190-200	190.6	(2102) Tantalus	0.060	1.47
	198.7	107P/Wilson-Harrington	0.0536	4.28
205-215	211.7	15P/Finlay	0.0452	6.75
	213.0	37P/Forbes	0.0820	6.35
225-235	227.3	D/Haneda-Campos (1978 R1)	0.0456	5.97
335-345	340.2	C/1998 U5 (LINEAR)	0.0019	1043
	343.9	144P/Kushida	0.0237	7.57
350-360	352.1	24P/Schaumasse	0.0395	8.25
	357.8	38P/Stephan-Oterma	0.0260	37.72
	359.3	15P/Finlay	0.0386	6.75

Conclusions

- Ionospheric layers attributed to meteoroid influx have been seen at Mars
- Meteor showers have been identified at Mars
- Possible parent comets for these meteor showers have been proposed