

Particle Radiation Levels for August 1978 through January 1980

As a part of a program to monitor spacecraft and instrument performance, a record of the radiation monitor values - FPM - is kept. The values of this counter may be used by observers to calculate the effect of the particle radiation field on the background of their images. (c.f. Observing with IUE by A. Holm and C.-C. Wu, IUE Newsletter No. 9) Data for the period August 1978 through January 1980 is presented in this report. For each day during which accurate records were kept, the peak value was used to characterize the radiation level for that day.

FPM	DN/hr	% /sat/hr	% days effected		
			Aug 78 Jan 79 (180 days)	Feb 79 Jul 79 (180 days)	Aug 79 Jan 80 (179 days)
≤ 1.0	≤ 20	9%	8%	12%	31%
1.0-1.5	20-40	9-17%	27%	28%	32%
1.5-2.0	40-110	17-45%	38%	38%	22%
2.0-2.5	110-310	45-130%	19%	15%	15%
≥ 2.5	≥ 310	130%	7%	6%	1%

FPM	Best Month Dec 79 (31 days)	Worst Month Sep 78 (30 days)
≤ 1.0	58%	0%
1.0-1.5	39%	13%
1.5-2.0	3%	57%
2.0-2.5	0%	10%
≤ 2.5	0%	20%

For purposes of planning it should be noted that times of high radiation level occur in stretches of 3-10 days with intervening periods of lower levels.

The radiation background, herein reported, does not affect the VILSPA or US1 shifts but virtually the entire US2 shift is affected. The characteristic time dependence of the particle radiation level is to rise to a maximum starting about four hours before perigee, peak at two hours before perigee and then dip down to a lower but non-zero level at perigee. The cycle continues with a second peak approximately two hours after perigee and the return to zero at about four hours after perigee. The local times affected may be determined by noting that perigee occurs at 06:20 sidereal time each day.

The trend towards lower radiation levels during the more recent time periods is probably real. On a short (1-5 days) time scale we have noted a strong anti-correlation of radiation level with solar activity. The long term trend present in this data may well simply reflect this anti-correlation on a longer time frame.

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