Radiation Effects Facility

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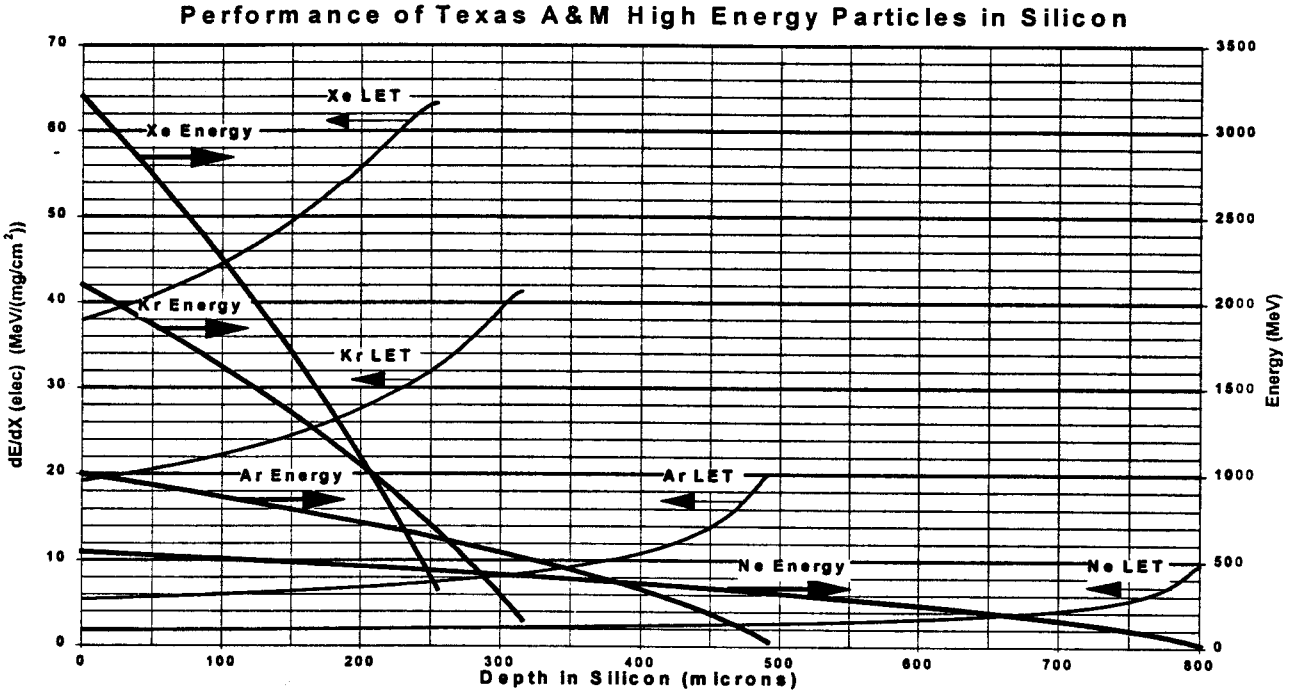
Operation of the Radiation Effects Facility has continued through the past year albeit at a much reduced rate of use. The decrease in use appears to be consistent with the experience of other facilities around the country. In this reporting period the facility was used for 389 hours, this is a 34% decrease from the 592 hours used in the 97-98 reporting period. Facility users over the past year include: Space Electronics, Inc., NASA-JSC, JPL, General Dynamics, Lockheed-Martin. Prairie View A&M University and the Texas A&M University Electrical Engineering Department.

Hardware and software improvements continue to be made to the facility. The degrader foils are now under control of the SEUSS software package. With the addition of the 25 MeV/A Ne^{22} particle beam, it is possible to have an almost continuous scan of incident LET values from 1.7 to ≈62 MeV/mg/cm^2 with the use of only four particle beams. See the graph at the end of this section.

An up-to-date list of standard particle beams for radiation testing is given in the table below. The Bi particle beam was added at the request of Prairie View A&M University.

Beams currently available for the Radiation Effects Facility

Particle Type	Mass (AMU)	Charge State	Q/M Ratio	E/A (MeV/A)	Energy (MeV)	LET(Si) (MeV/cm^2/mg)
C	12	2+	0.167	10.2	122	1.2
O	16	3+	0.188	13.2	211	1.8
Ne	20	4+	0.200	14.9	298	2.5
Ne	**22**	**6+**	**0.273**	**24.8**	**546**	**1.7**
Ar	40	8+	0.200	15.0	600	7.7
Ar	**40**	**11+**	**0.275**	**25.0**	**1000**	**5.4**
Cu	63	13+	0.206	16.0	1008	17.2
Kr	84	17+	0.202	15.3	1285	25.1
Kr	84	16+	0.191	13.6	1141	26.6
Kr	84	15+	0.179	12.0	1002	28.2
Kr	**84**	**23+**	**0.274**	**25.0**	**2100**	**19.0**
Nb	93	16+	0.172	11.1	1030	35.3
Nb	93	15+	0.161	9.8	907	36.8
Xe	129	26+	0.202	15.2	1961	43.7
Xe	**129**	**31+**	**0.240**	**24.8**	**3200**	**37.7**
Au	197	33+	0.168	10.5	2068	86.6
Bi	209	35+	.167	10.5	2195	91.8


Performance of Texas A&M High Energy Particles in Silicon
dE/dX (elec) (MeV/(mg/cm²))
Energy (MeV)
Depth in Silicon (microns)
Xe LET
Xe Energy
Kr Energy
Kr LET
Ar Energy
Ar LET
Ne Energy
Ne LET
0
10
20
30
40
50
60
70
0
500
1000
1500
2000
2500
3000
3500
0
100
200
300
400
500
600
700
800