

Autonomous Stellar Compass / Star Tracker

Technical University of Denmark



Autonomous Stellar Compass

Irradiation Facilities

Gamma

Ir-192 400 keV Technical University of Denmark

Electron

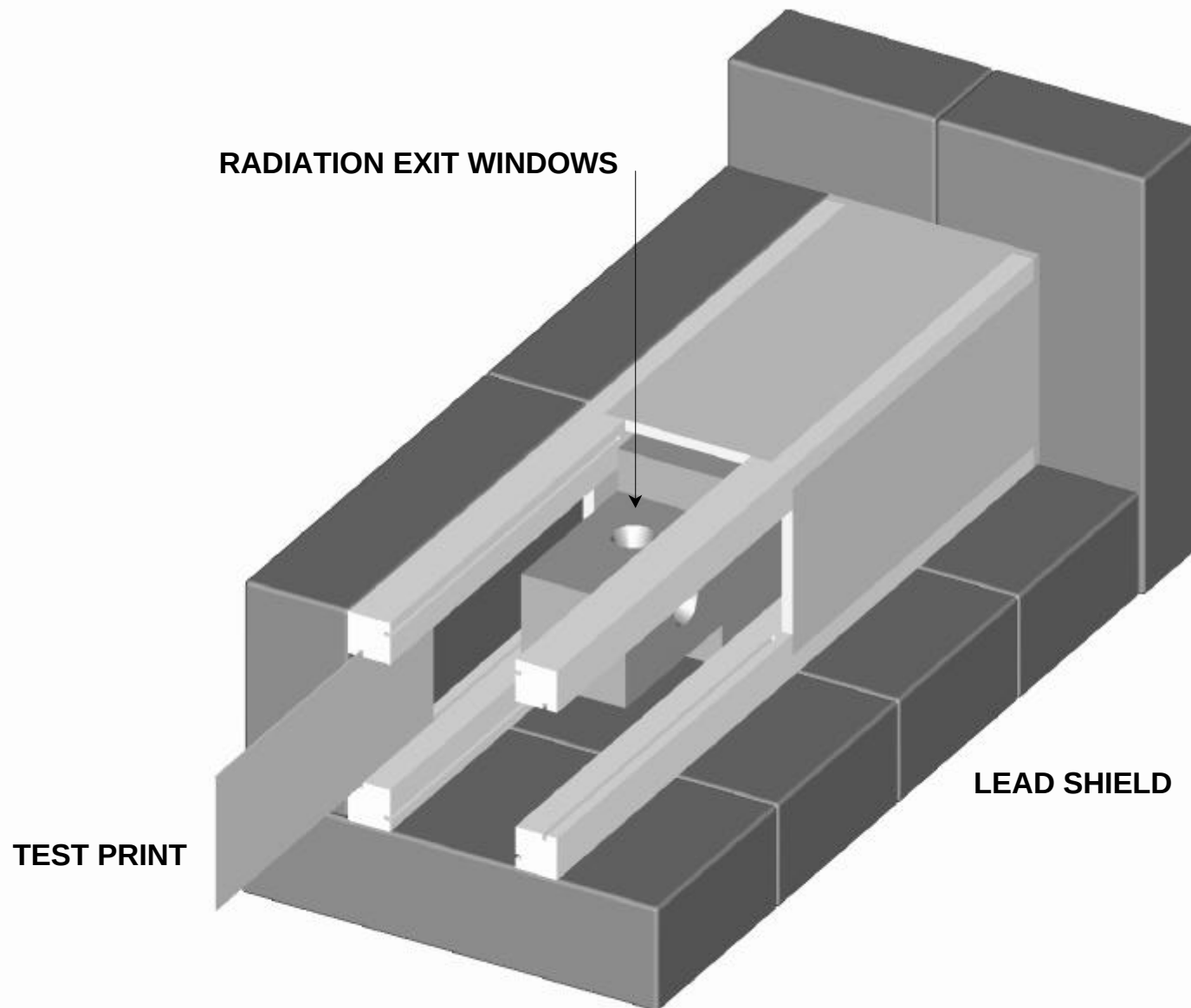
Sr-90 1 MeV Technical University of Denmark

Proton

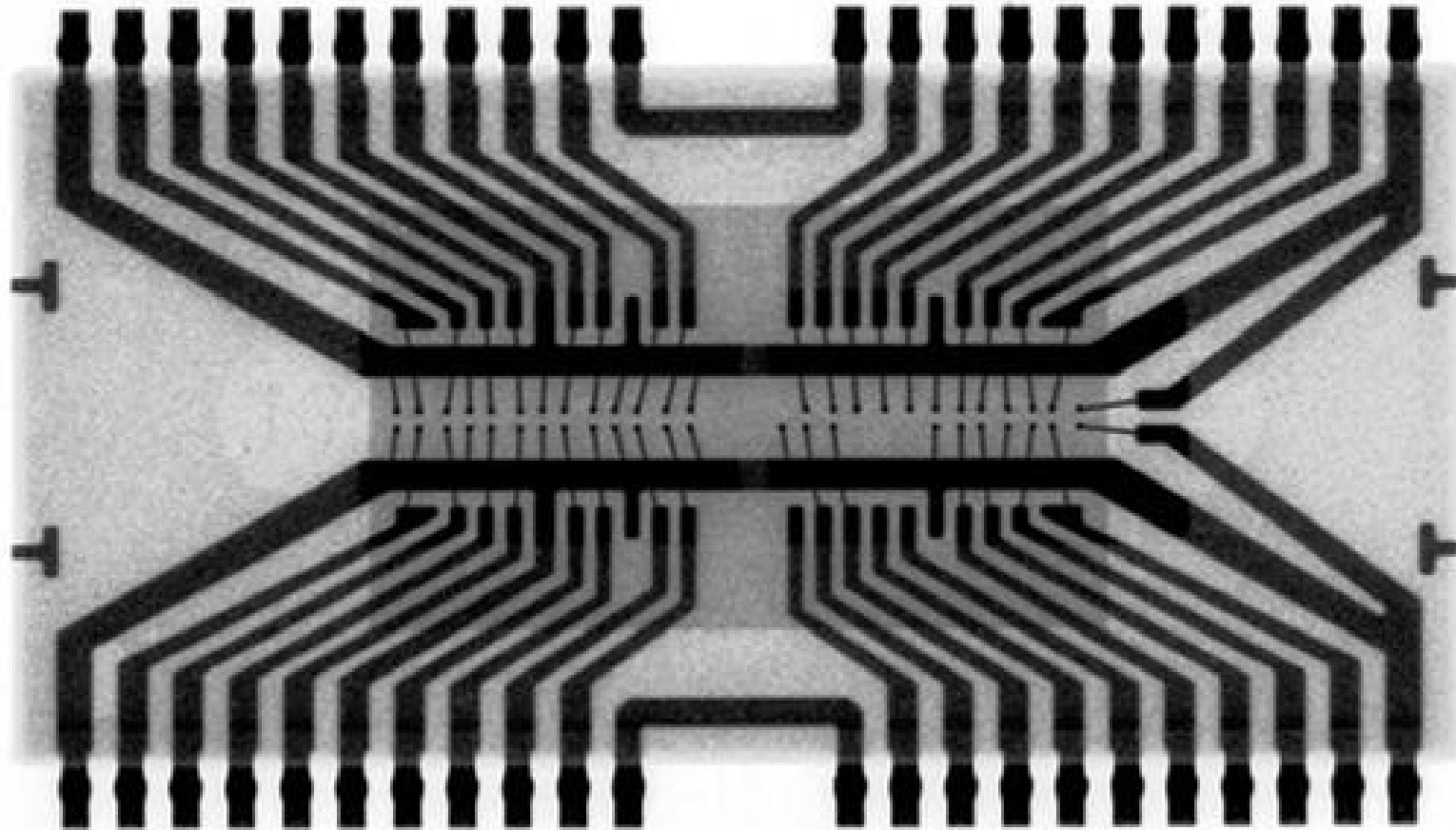
Cyclotron 32 MeV University Hospital, Copenhagen

Cyclotron 300 MeV Proton Irradiation Facility, PSI

IRIDIUM-192 GAMMA RAY IRRADIATION TEST FACILITY

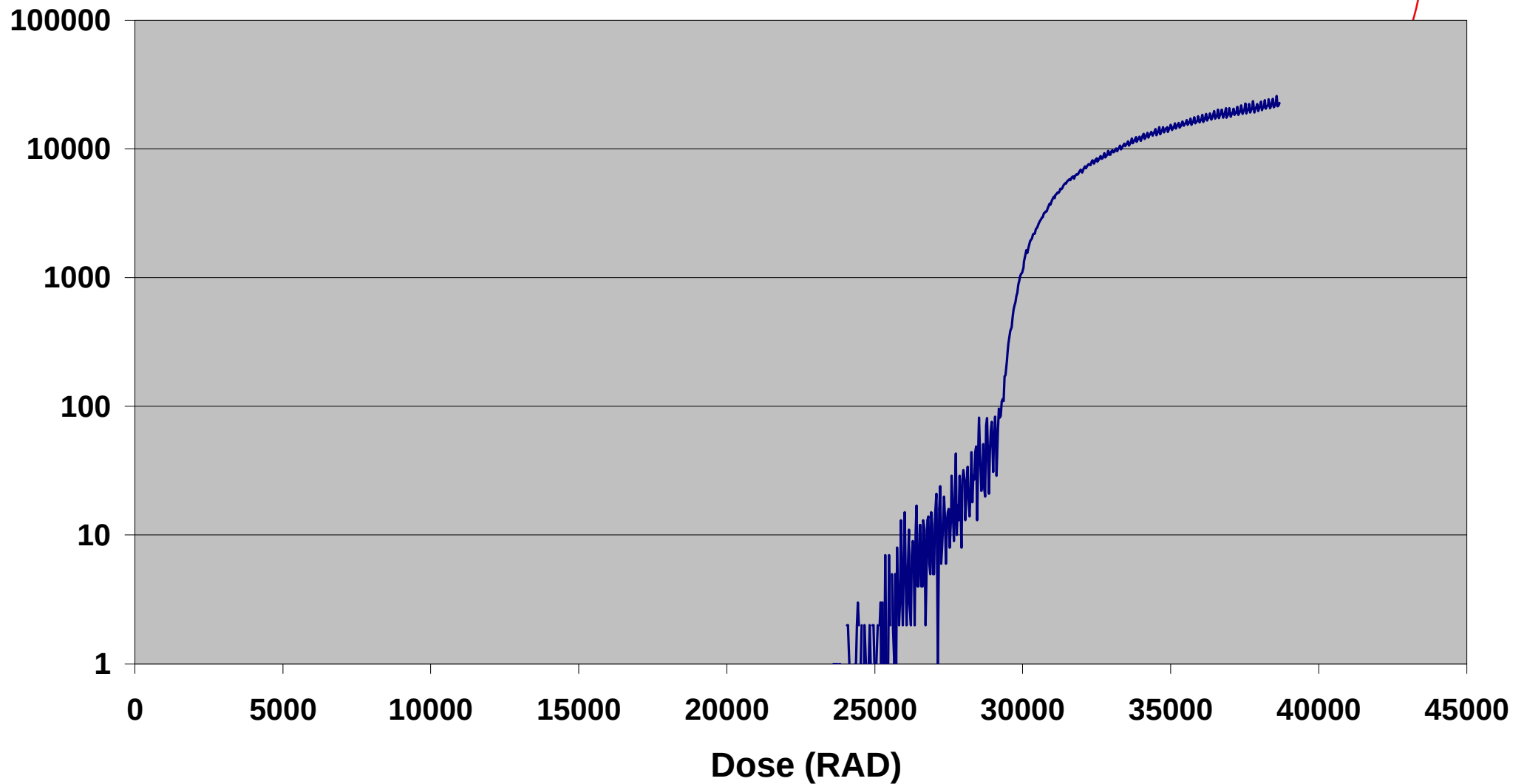


Hyundai HY5118160BTC60 1Mbit x 16 DRAM

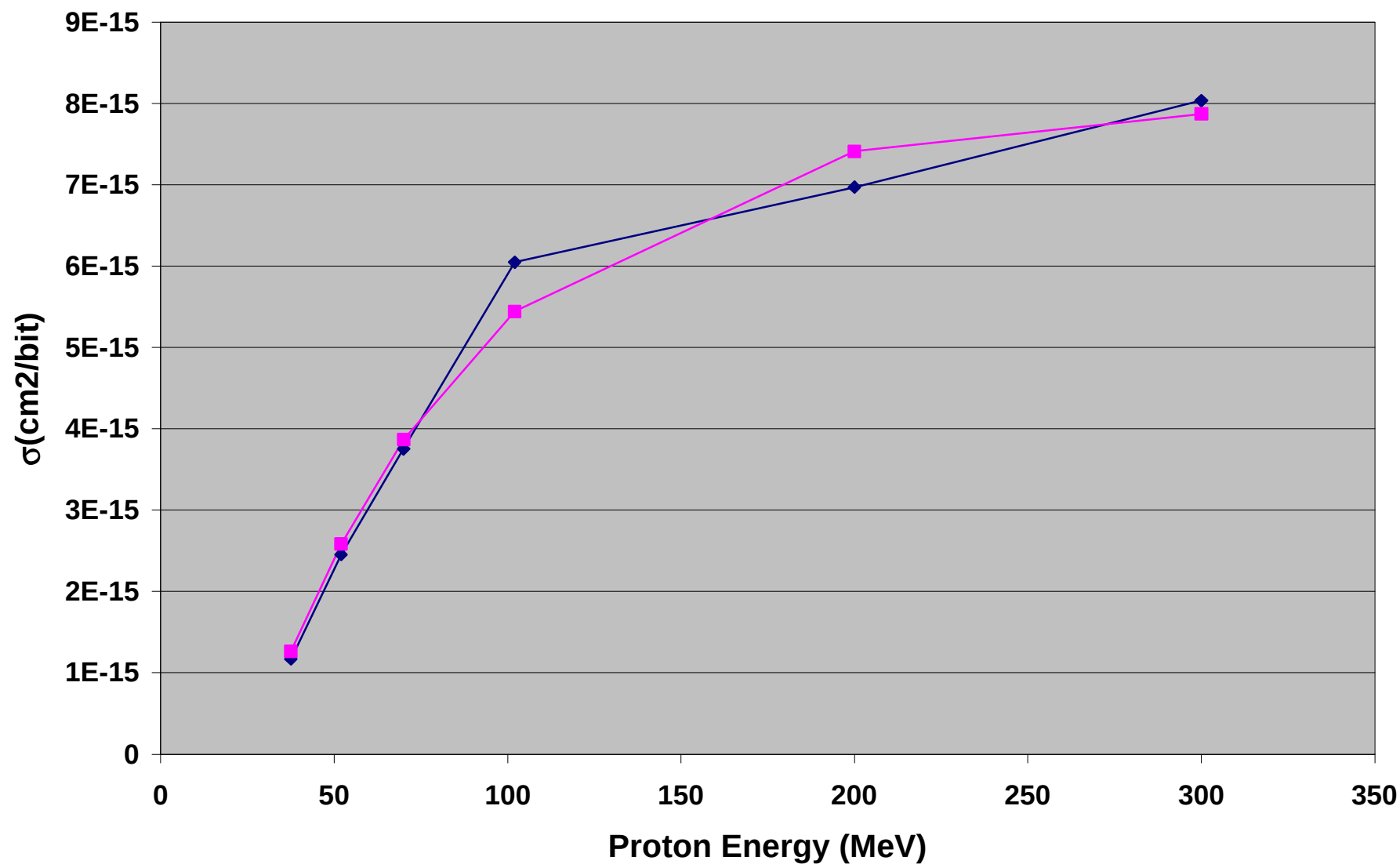


Hyundai DRAM Gamma Irradiation

Bit Errors



Proton SEU Cross Section



Autonomous Stellar Compass

300 MeV Proton Irradiation Results for PROBA

AMD AM486 DX-100 Microprocessor

Cross Section $1\text{E-}9\text{ cm}^2$

PROBA Orbit: 1 CPU Upset / 3 months

Hyundai HY5118160BTC60 DRAM

Cross Section $8\text{E-}15\text{ cm}^2/\text{bit} = 1.2\text{E-}7\text{ cm}^2/\text{device}$

SEU Cutoff Energy 26 MeV

ROBA Orbit: 1 Critical DRAM error / 3 months

1 DRAM bit upset / day