

Development of Neutron flux meter

at BEO Moussala

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On behalf of BEO Moussala

A wide-angle photograph of a mountain range. The foreground is covered in patches of snow and sparse vegetation. The middle ground shows more extensive snow fields and rocky terrain. In the background, several peaks rise against a clear blue sky with wispy white clouds.

Outlook

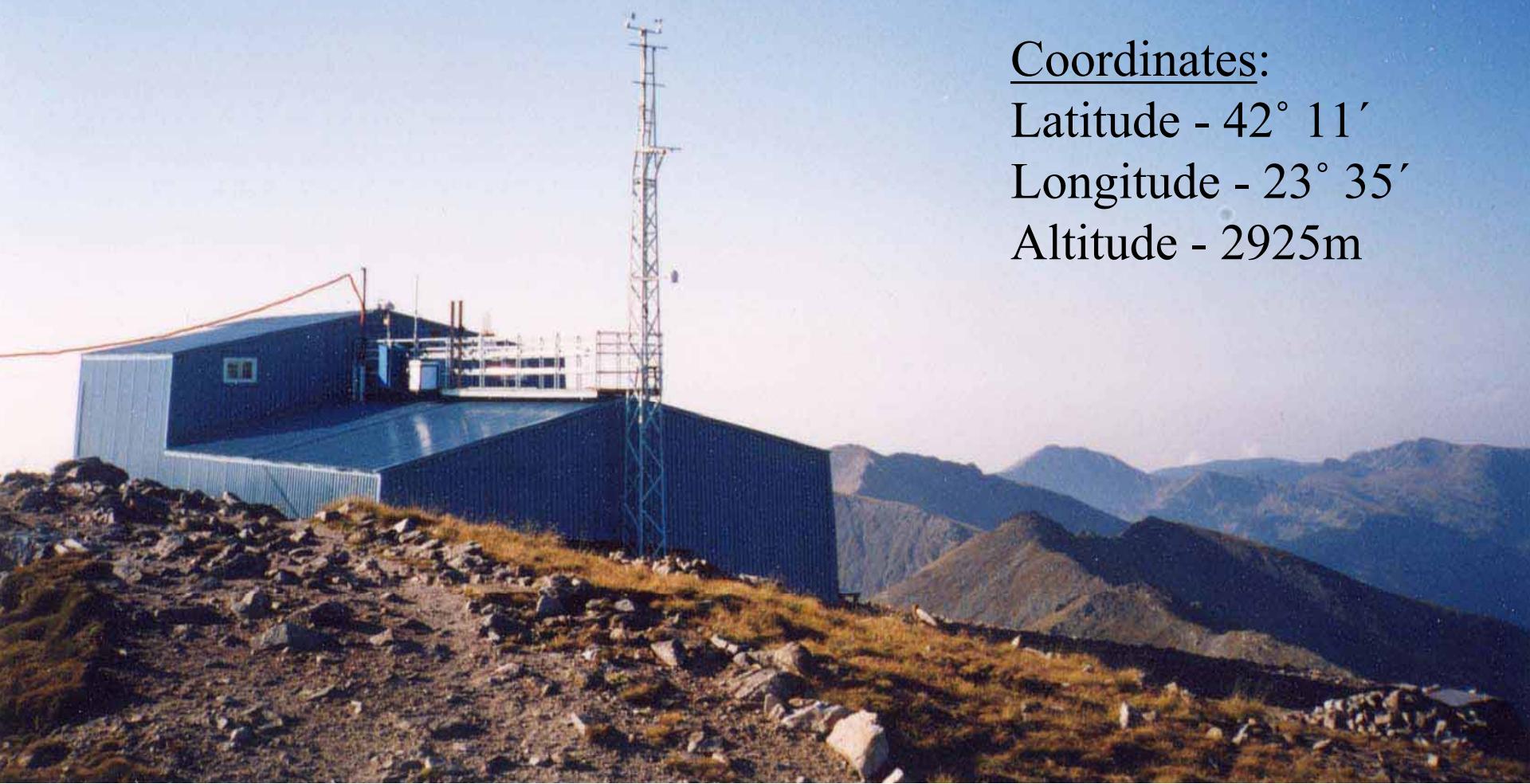
Present activities

Neutron measurements

Future plans

Discussion

BEO Moussala



Coordinates:

Latitude - $42^{\circ} 11'$

Longitude - $23^{\circ} 35'$

Altitude - 2925m

The Sun-Earth Connected System

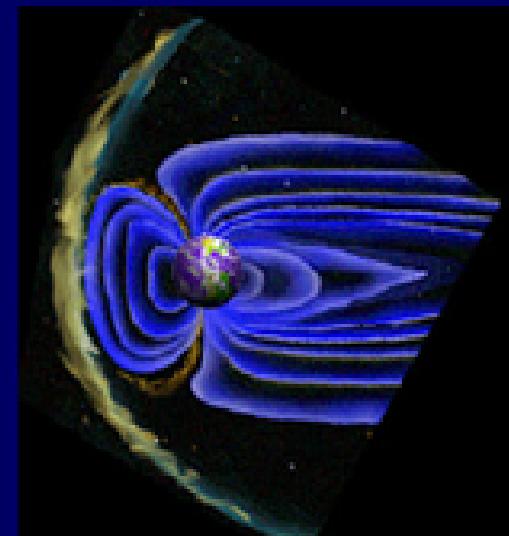
Variable Star



Varying

- Radiation
- Solar Wind
- Energetic Particles

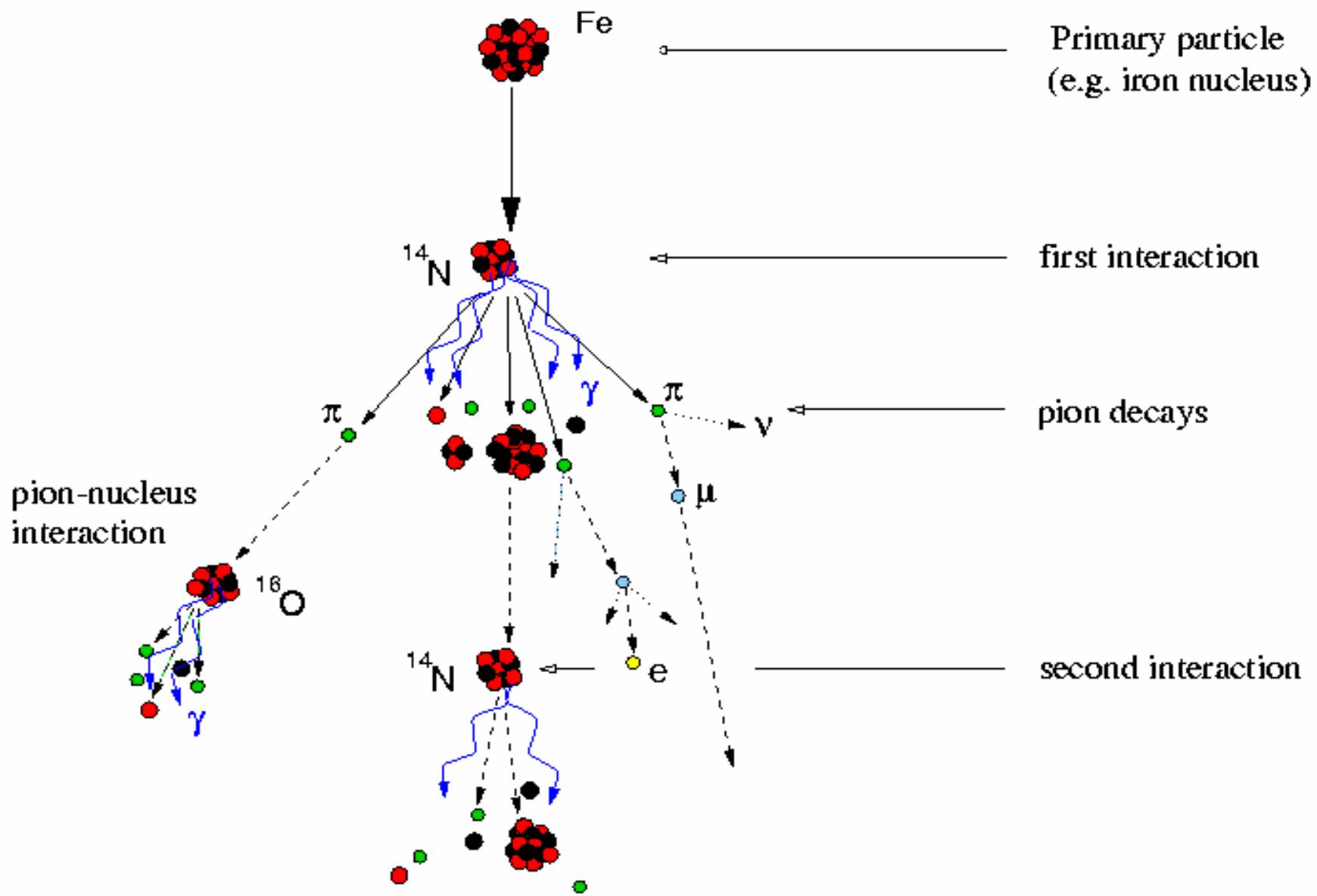
Planet

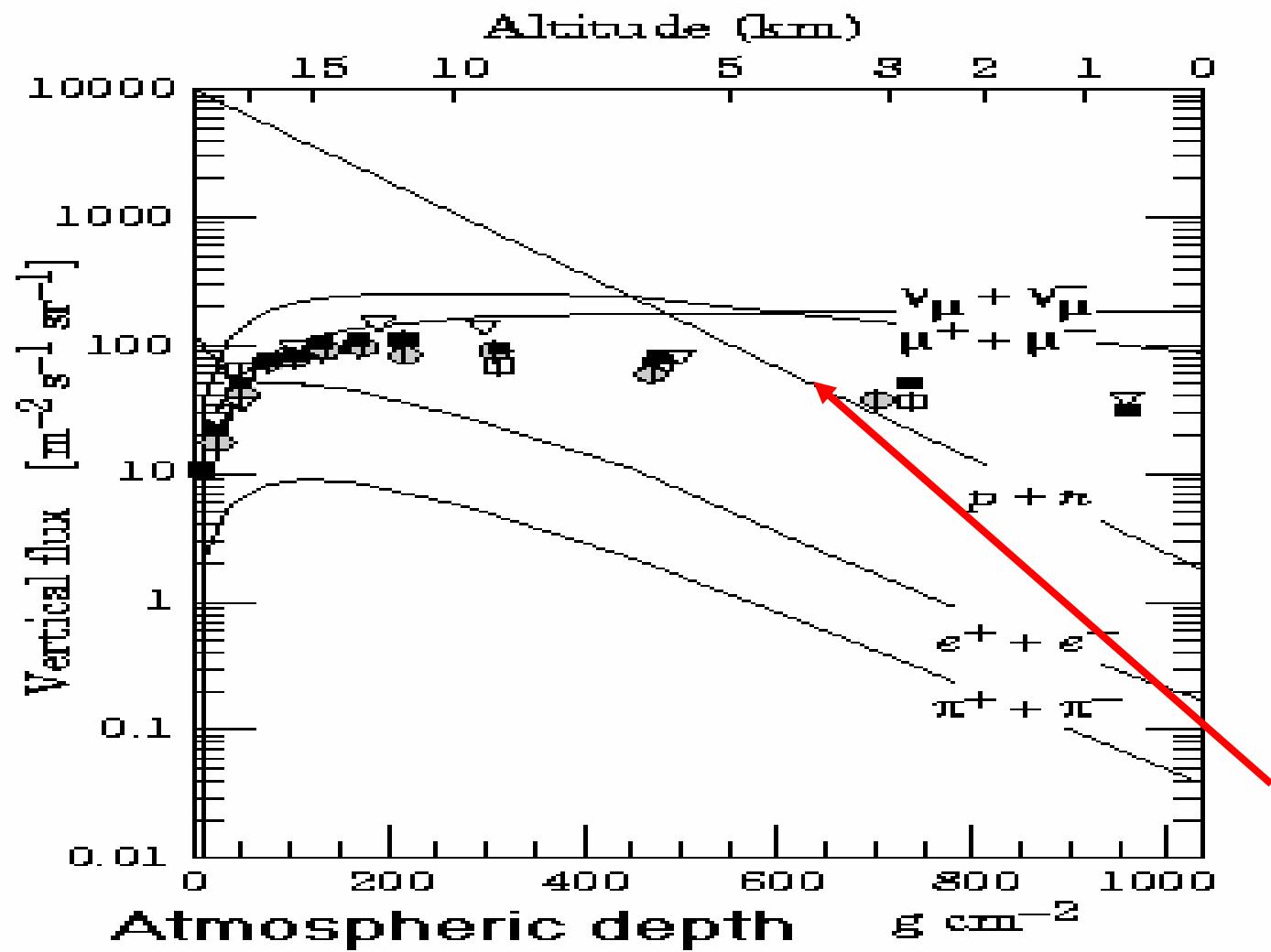


Questions:

- *How and why does the Sun vary?*
- *How does the Earth respond?*
- *What are the impacts on humanity?*

Development of cosmic-ray air showers





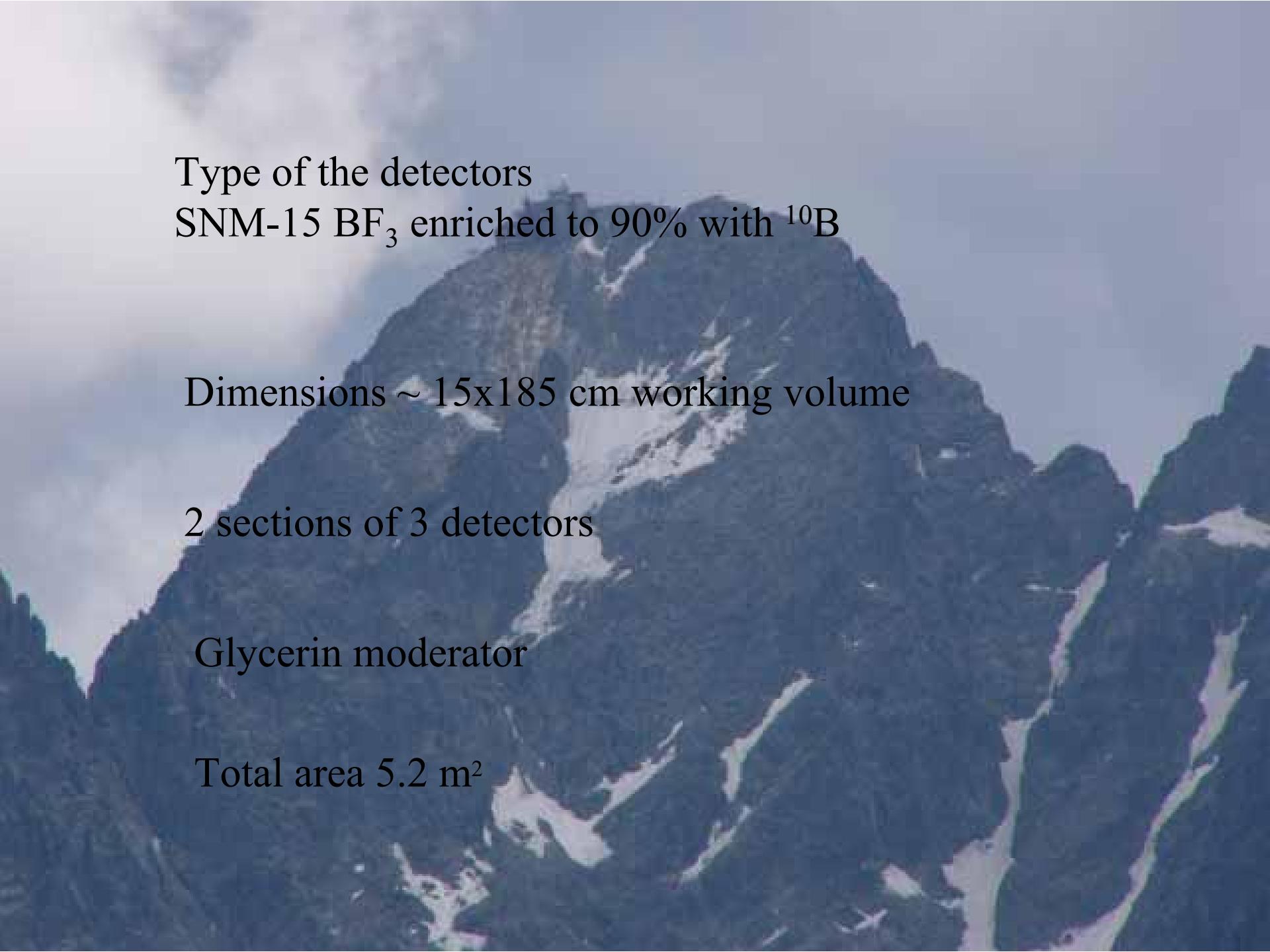
Neutron flux meter





3818

382

The background image shows a majestic, dark-colored mountain range with sharp peaks and patches of white snow or ice clinging to its slopes. The sky above is filled with soft, greyish-white clouds.

Type of the detectors

SNM-15 BF_3 enriched to 90% with ^{10}B

Dimensions $\sim 15 \times 185$ cm working volume

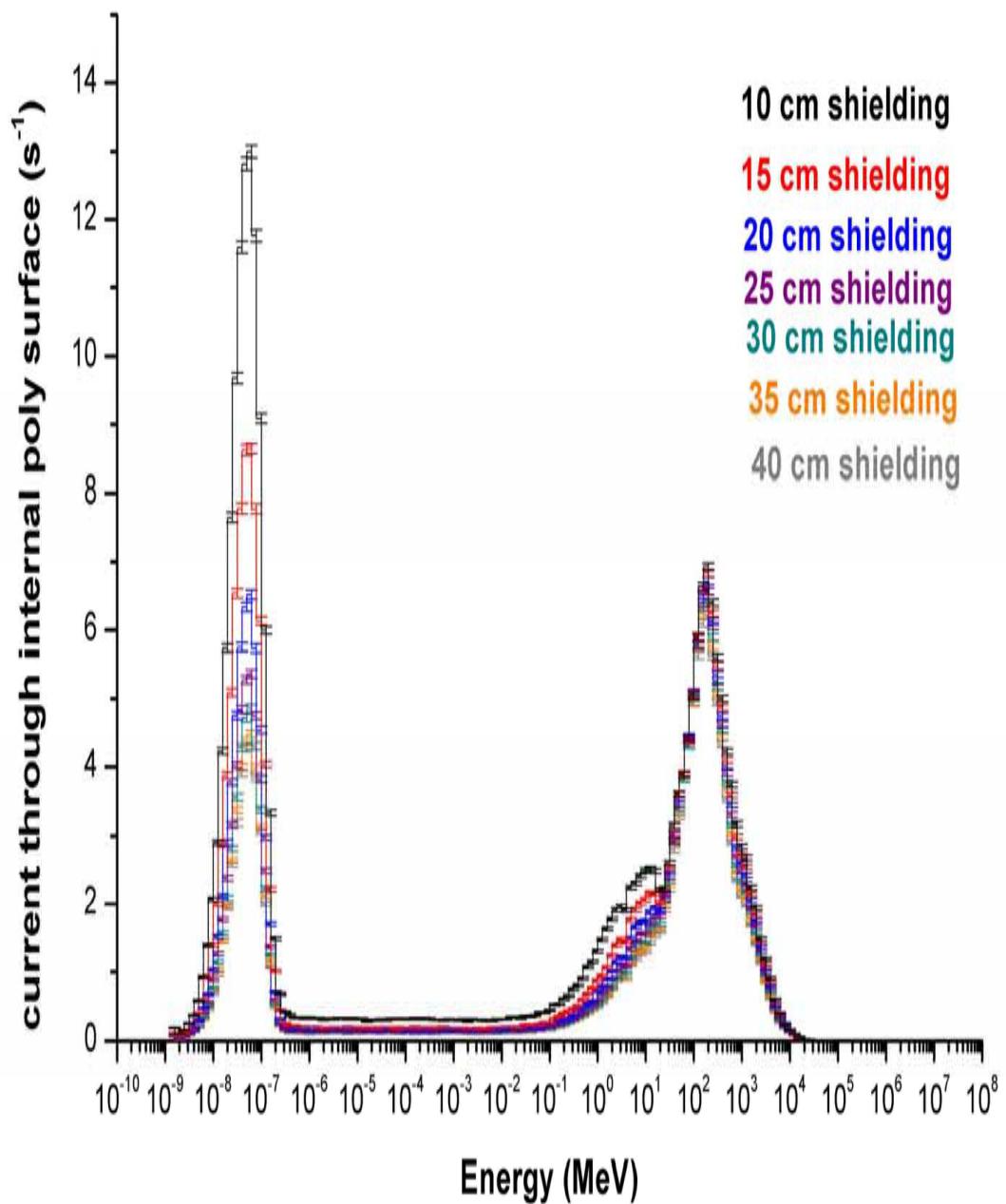
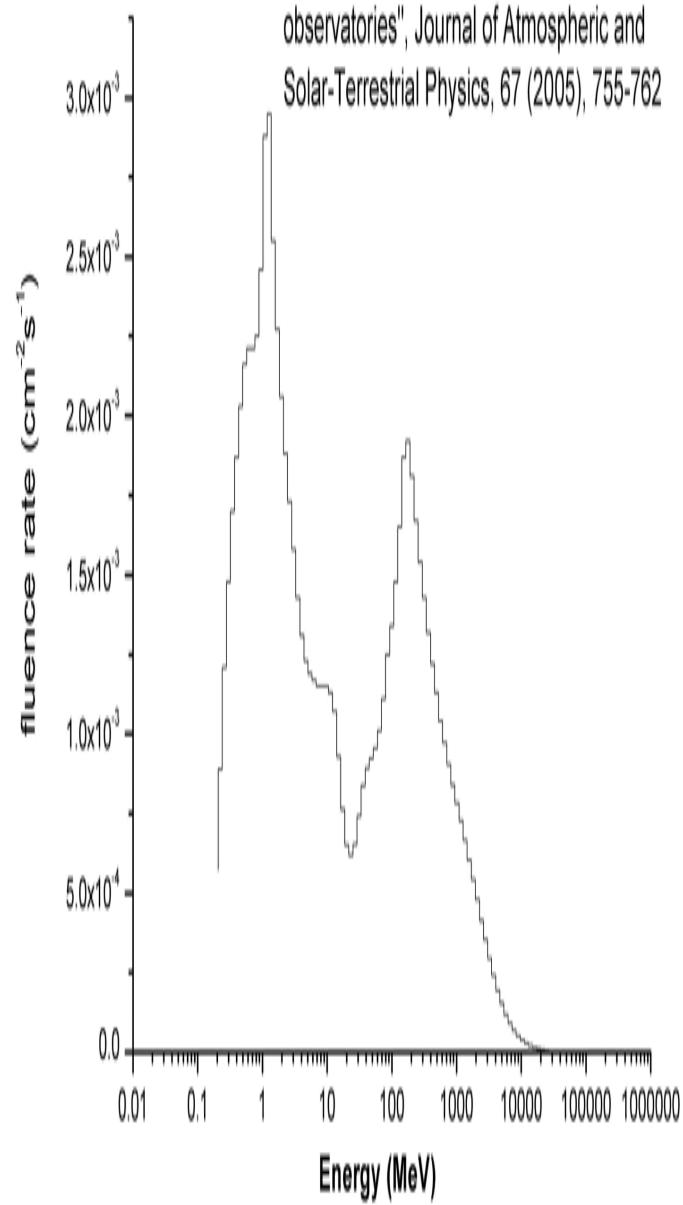
2 sections of 3 detectors

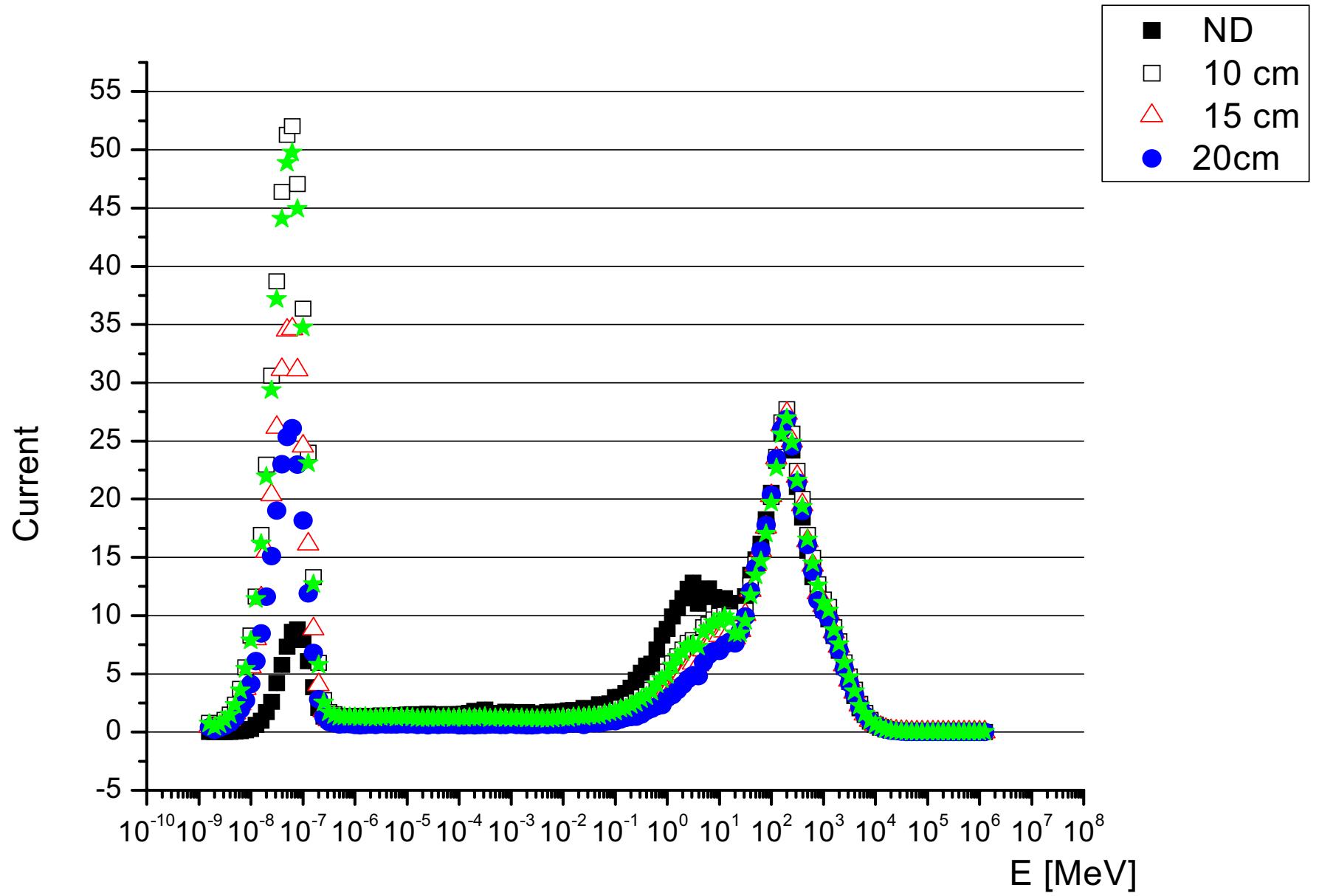
Glycerin moderator

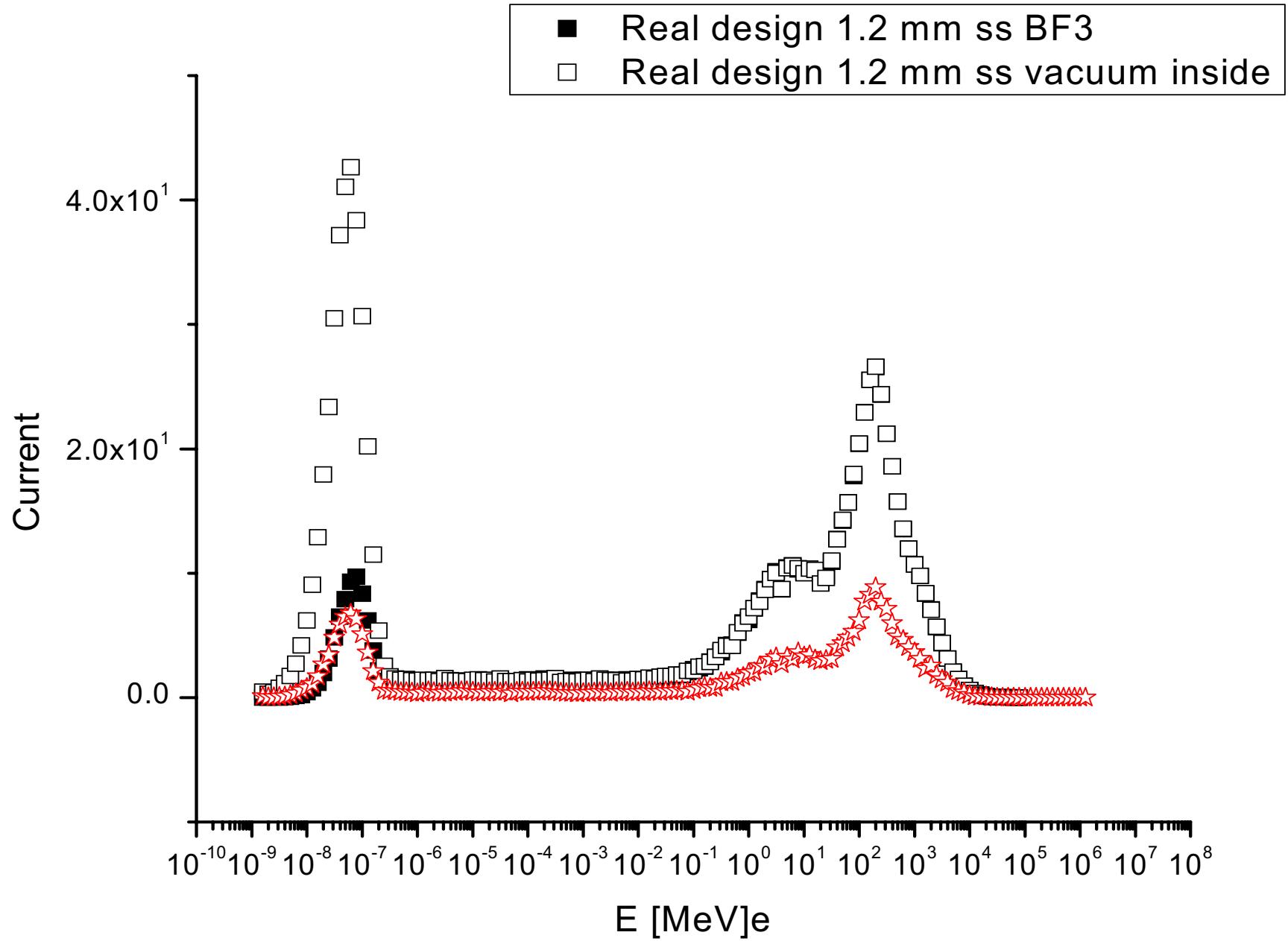
Total area 5.2 m^2

Testa Grigia neutron spectrum:

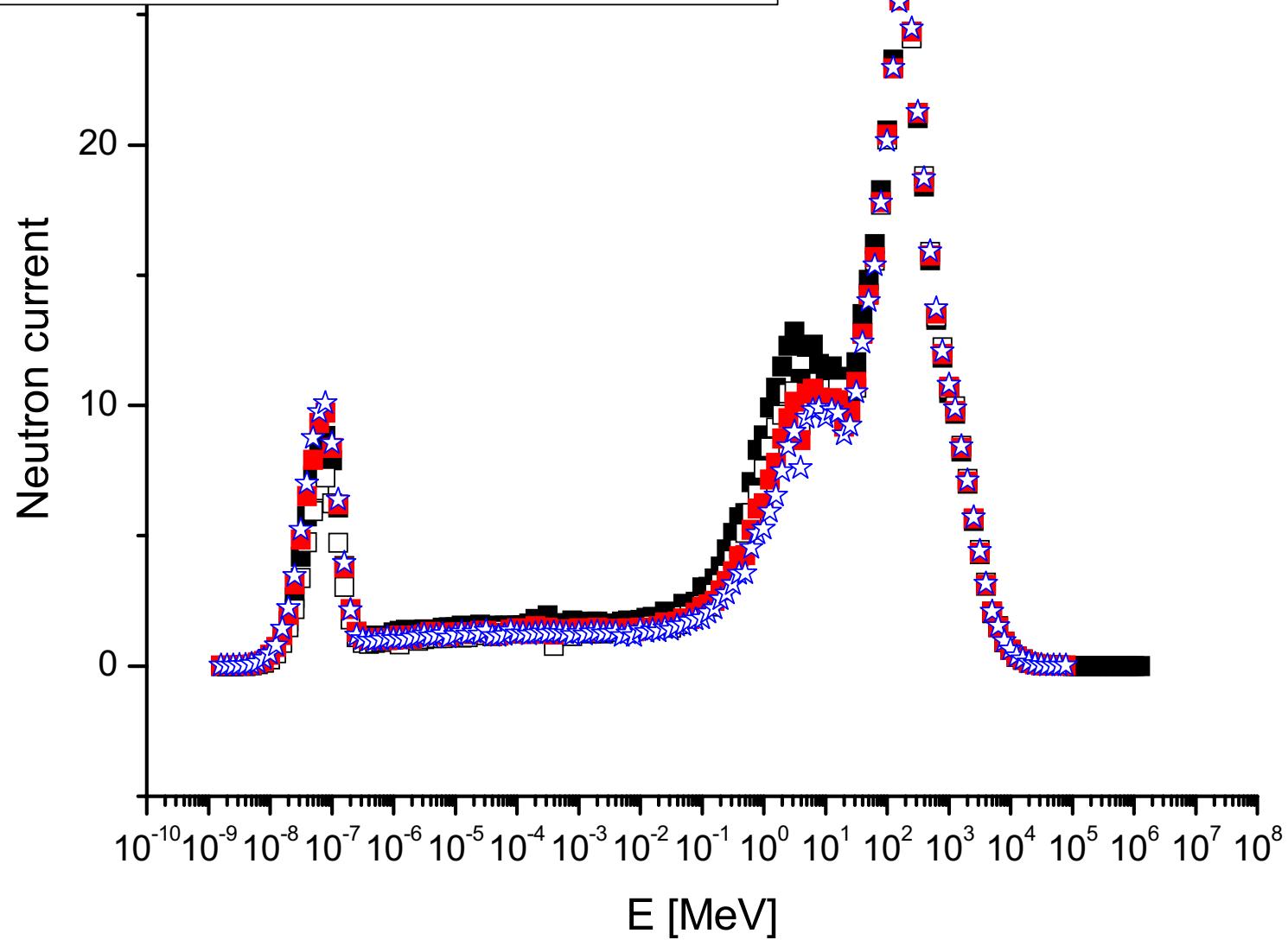
A. Zanini et al. "Neutron spectrometry at high mountain observatories", Journal of Atmospheric and Solar-Terrestrial Physics, 67 (2005), 755-762

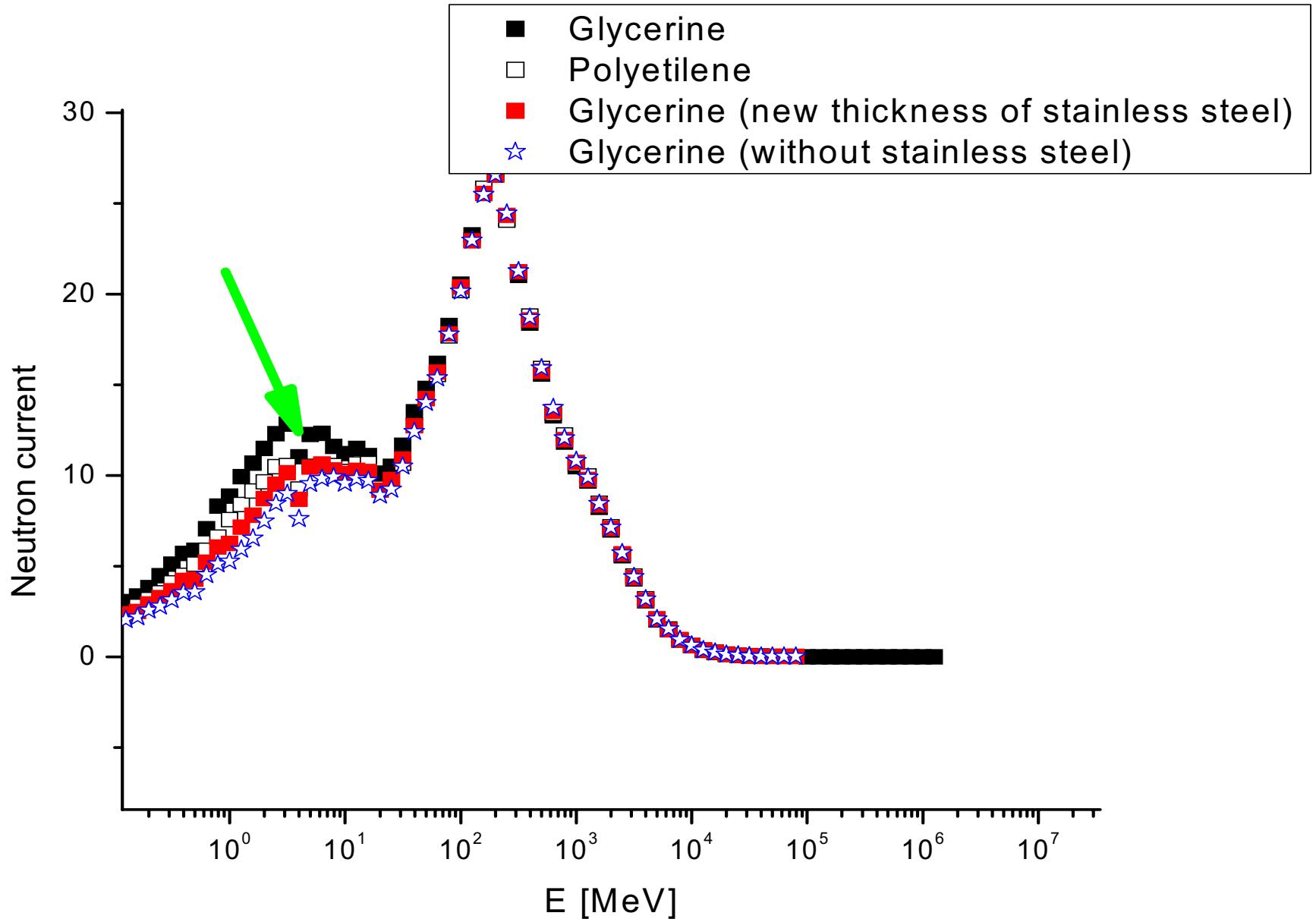


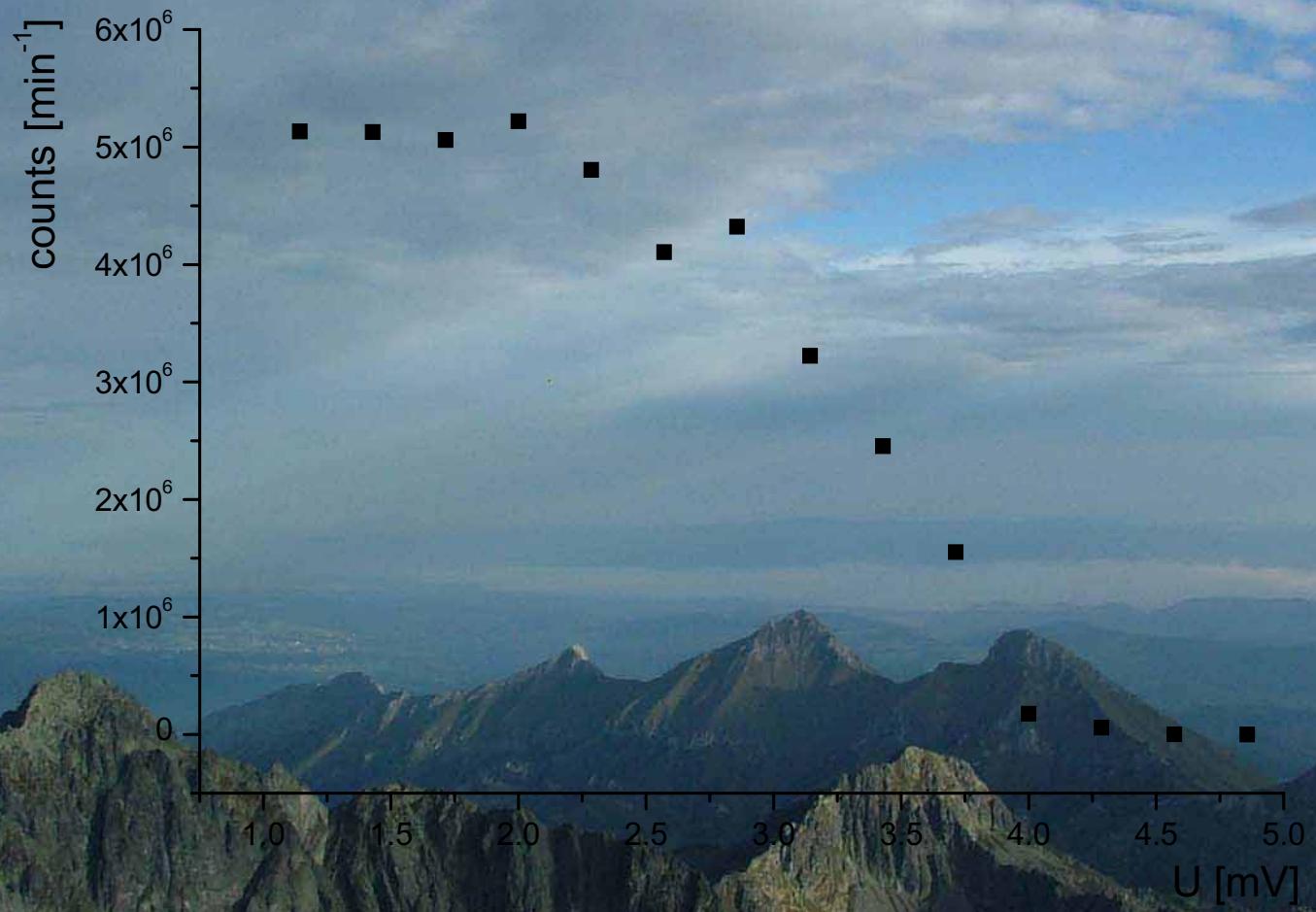




- Glycerine
- Polyethylene
- Glycerine (new thickness of stainless steel)
- ☆ Glycerine (without stainless steel)







Future work

Detailed Monte Carlo simulations ~ INFN Torino

Estimation of the ambient dose rate

Small neutron monitor

**Photomultiplier FEU-49
in Housing**

**4 Plastic Scintillators
Each 50x50x5cm**

5cm Thick Lead

**Neutron Detector
25cm Thick
50x50cm**

Box for Electronics



A wide-angle photograph of a mountain range. The foreground shows a snow-covered slope with some rocky terrain. In the middle ground, there are several peaks, some of which are covered in snow. The sky above is a clear, pale blue.

Thank You for Your Attention