Contribution ID: **105** Type: **Poster**

Compact Monoenergetic Proton Generator in MeV Region Using NANOGAN™

For simple applications, such as the calibration of a charged particle detector, a multi-MeV proton generator may be preferable to cyclotrons or electrostatic accelerators such as Van de Graaff generator. Thus, a compact proton generating system, consisting of NANOGAN™ and a deuterated polyethylene target, was developed at the Research Center for Nuclear Physics at Osaka University. A 3He2+ beam was generated by the NANOGAN™ with the acceleration voltage of 20˜40 kV in an experiment that utilized the fusion reaction 3He + deuteron (D) ⟶ proton(P) + 4He. Protons with energies of 14.67 MeV were generated at the atmosphere side of the target in the experimental setup, using a novel target base with a thin nickel foil and Polyimide film window.

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Session Classification: Poster Session 2

Track Classification: Applications and related technologies