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Ion-Beam Application to Energy, Environment and Medical Technology

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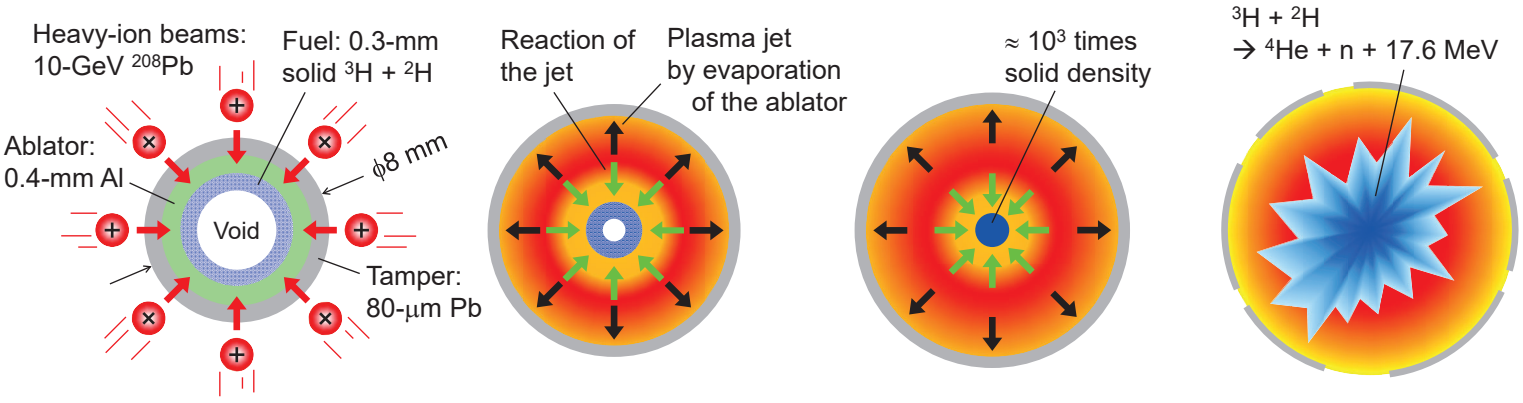
- Heavy-ion inertial-confinement fusion
- Medical application of proton-induced monochromatic X-rays
- Microanalysis using fast ion beams

We aim at development of sustainable energy, advanced medical technology and analytical technique for environment and materials based on ion beams from accelerators.



①Energy deposition of heavy-ions in the ablator layer

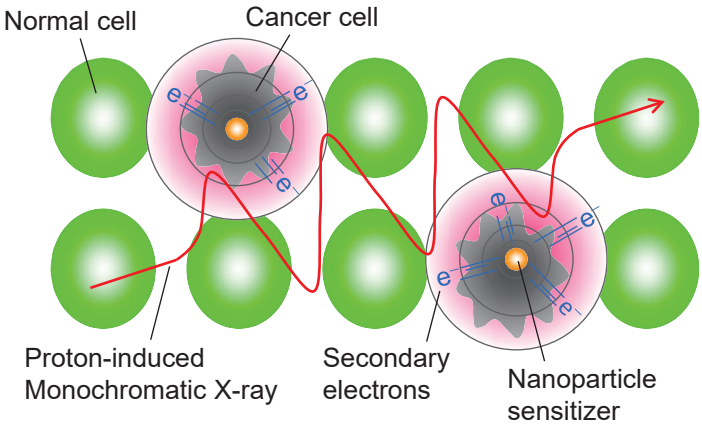
②Inward acceleration of fuel shell by ablation pressure

③Spherically-symmetric fuel compression (implosion)

④Ignition!

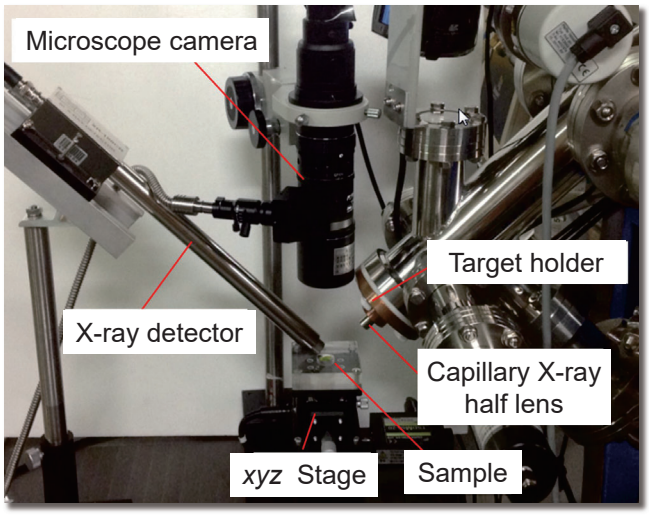
Heavy-ion driven inertial confinement fusion

- Implosion scenario depends on details of energy deposition from the incident beam to the target.
- Stopping power of heavy ions in hot ionized matter is experimentally investigated for optimal target design.



Selective internal radiation cancer therapy

- The patient is injected with a tumor-targeting drug containing high-*Z* nanoparticles.
- The particles efficiently emit secondary electrons when irradiated with proton-induced monochromatic X-rays.
- High dose only to cancer cells; low dose to normal cells



Low-dose proton-induced XRF system

- Maximum X-ray excitation efficiency and minimum dose to the sample by proton-induced monochromatic X-rays.
- Application to in vivo measurement of biological samples and precious cultural heritage