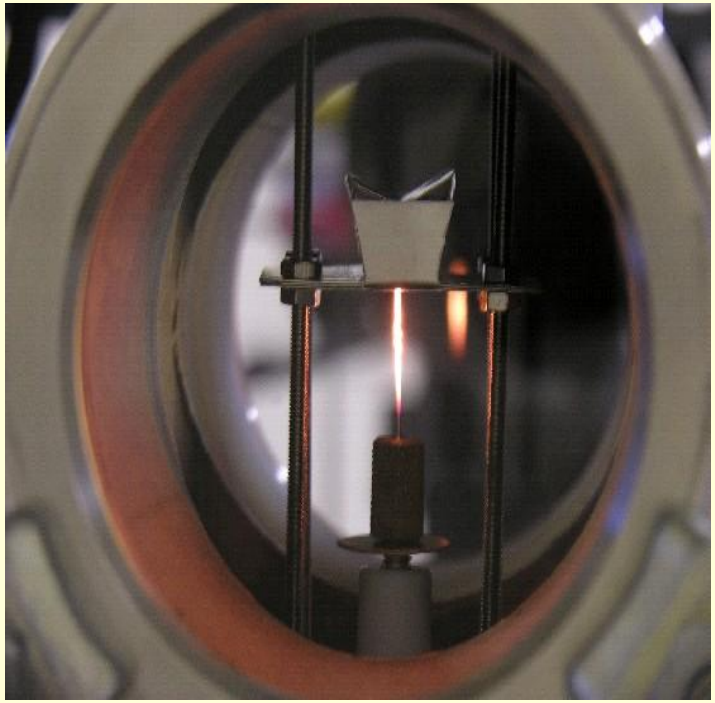




High Power Target Studies at Sheffield

Chris Booth

Past Target Activities

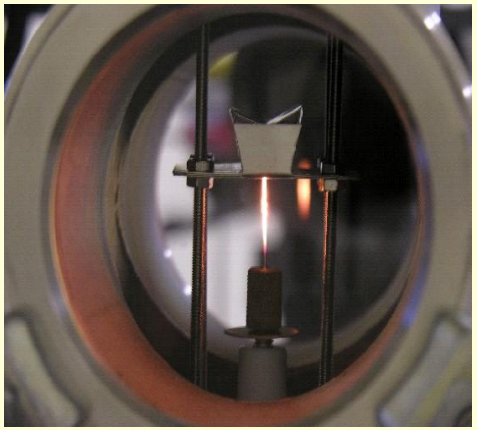
Chief contributor: Goran Skoro

1) Modelling Studies:

- Beam-induced shock in NF targets
  - ANSYS/LS-DYNA
  - Shock as function of size & shape of target, time-structure of beam
- Optimisation of particle production at NF targets
- Pion production at existing targets
  - MARS simulation of HARP target
  - Comparison with data
- Li target for Boron Neutron Capture Therapy
  - Target cooling study
  - With Birmingham University Hospital

2) Experimental Studies:

- Material properties under extreme conditions (temperature and shock)
  - Tungsten, tantalum – modulus of elasticity, yield strength, etc.
  - Wire tests, 8 kA pulse, 100 ns rise-time, 1600-2000 K
  - Laser Doppler Vibrometer, VISAR
  - Implications of NF target lifetime
  - Several publications, ...


- MERIT/nTOF11
  - Mercury jet experiment at CERN
  - Developed techniques for beam intensity characterisation

Future

- Lost Goran to post on ISIS!
- Current grant funds 50% RA post for 4 years.
- Some other money available.
- $\Rightarrow$ Advertising full-time post for $\geq$3 years.
- Plus ~10% CNB.
- Small group – looking for collaborative activities.
- Other expertise within wider Sheffield group:
  - Modelling experience with MARS, FLUKA, MNCPX
  - Neutron production and detection

Please let me know of any possible applicants for the post!

Research Interests

- General high power target modelling studies.
- Applications to ISIS upgrade.
  - Collaborative work with GS?
- Thermal shock.
- Neutron production, moderation.
- Design studies (target, end-station).

- Sub-critical Thorium Reactors – is this WP funded?

- Exact area may also depend on skills of appointee.