The FMIT Liquid Lithium Target

- FMIT = Fusion Materials Irradation Test
- Planned for the Hanford Reactor Site $\approx$ 1980.
- Project abruptly cancelled $\approx$ 1983 with little surviving documentation.
- Idea: Deuterium beam (35 Mev, 0.1 A, 80 MHz, 3.5 MW) + liquid Li $\rightarrow$ He + n $\Rightarrow 3 \times 10^{16}$ n/s.
  [Also about 10^{14} ^{6}He/s.]
- Range of 35 MeV deuterium in lithium is 1.4 cm.
- Spot size $\approx 1 \times 3$ cm^2.
- 3.5 MW beam power would melt solid lithium.
- $\Rightarrow$ Flow lithium at 17 m/s with free surface towards beam.
- Then $T_{\rm max} \approx 740$ C.
- Because rep rate is 80 MHz, claim no splatter of lithium.
- Peak energy deposition $\approx$ 1000 J/gm, but spread out over 1 ms.
- $\Rightarrow$ About 1 J/gm during one sound wave transit time.

- FMIT idea still alive as IFMIF in Japan, JAERI/Tokai (where the JHF will be built).
- Water mockup has been built; beam tests some day??