A High-Power Test of an X-Band Molybdenum-Iris Structure

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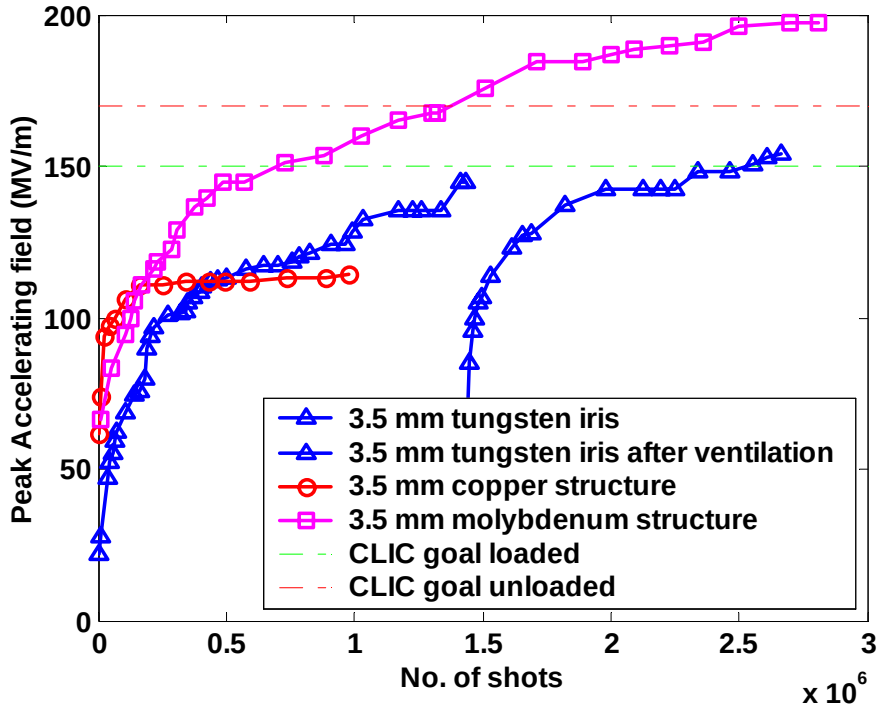
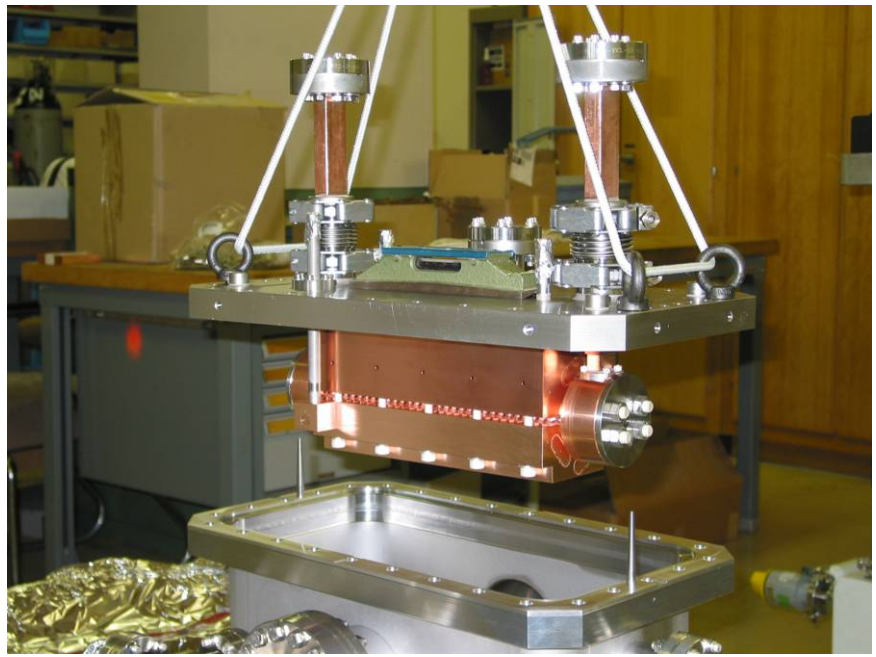
THP34
Linac 2004
19-8-2004

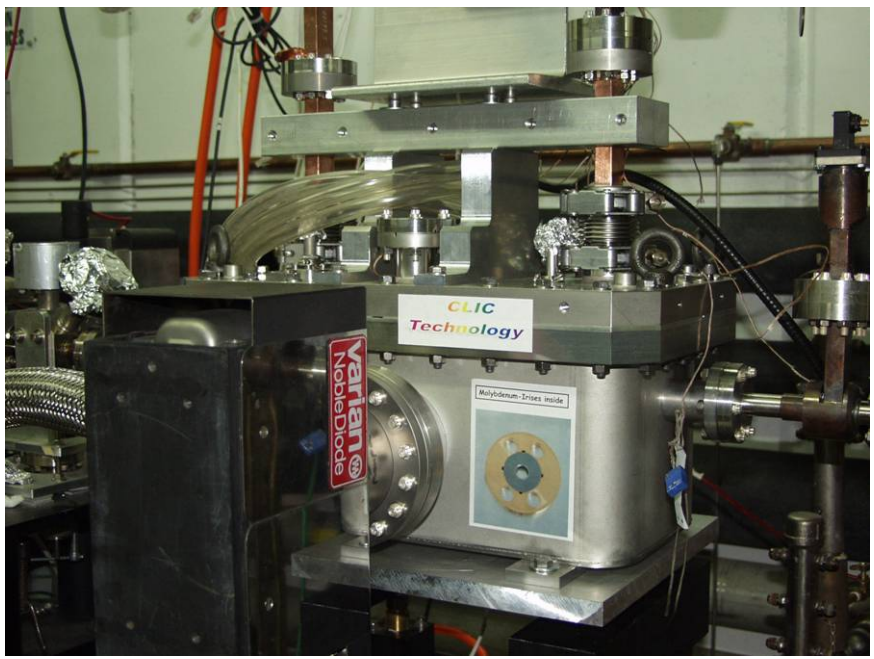
30 GHz test, 2002



Great result, but only 15 ns pulse, CLIC needs 60 ns
(formerly 150 ns, see poster THP72)

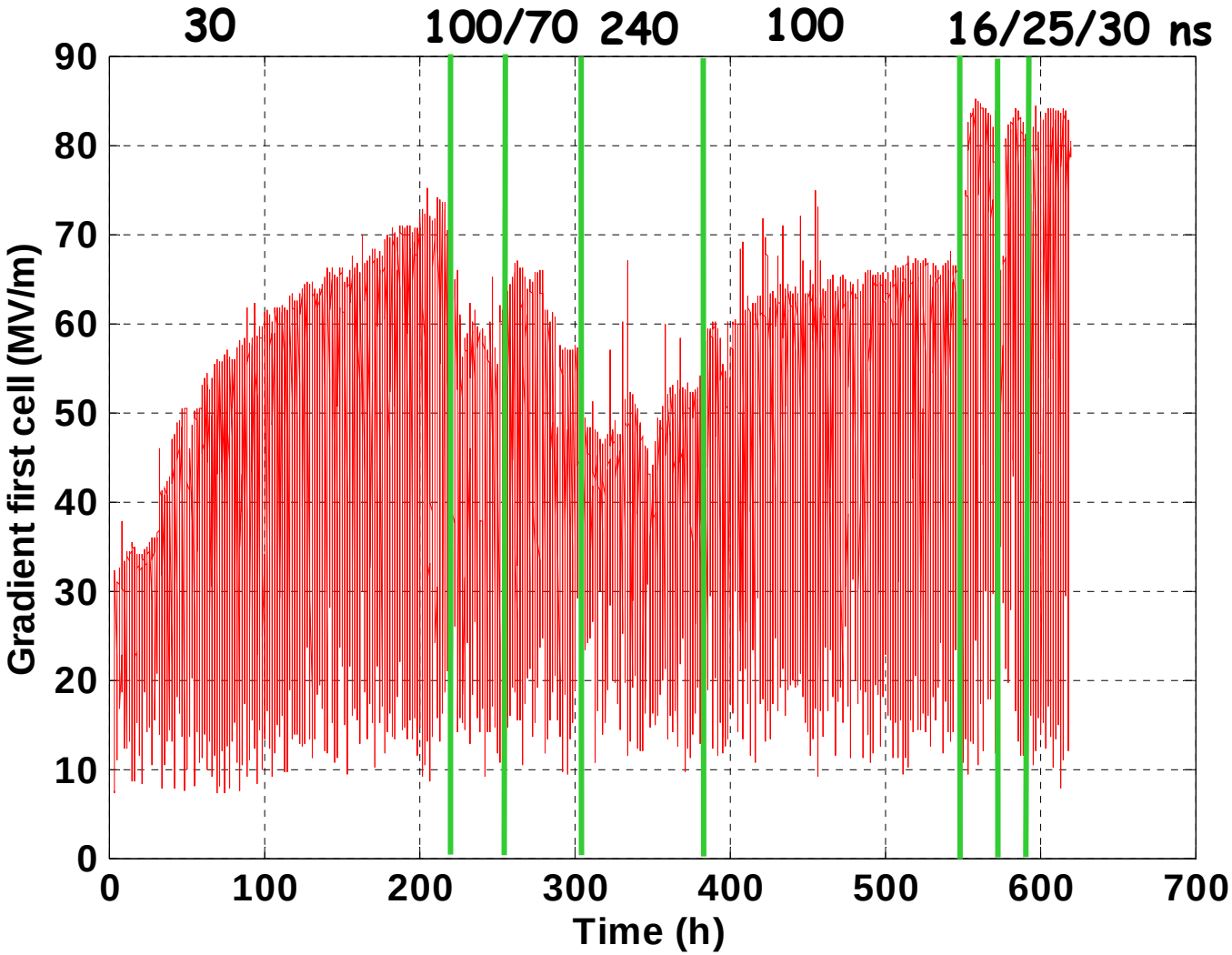
11 GHz structure for long-pulse testing at NLCTA. Exactly scaled from 30 GHz



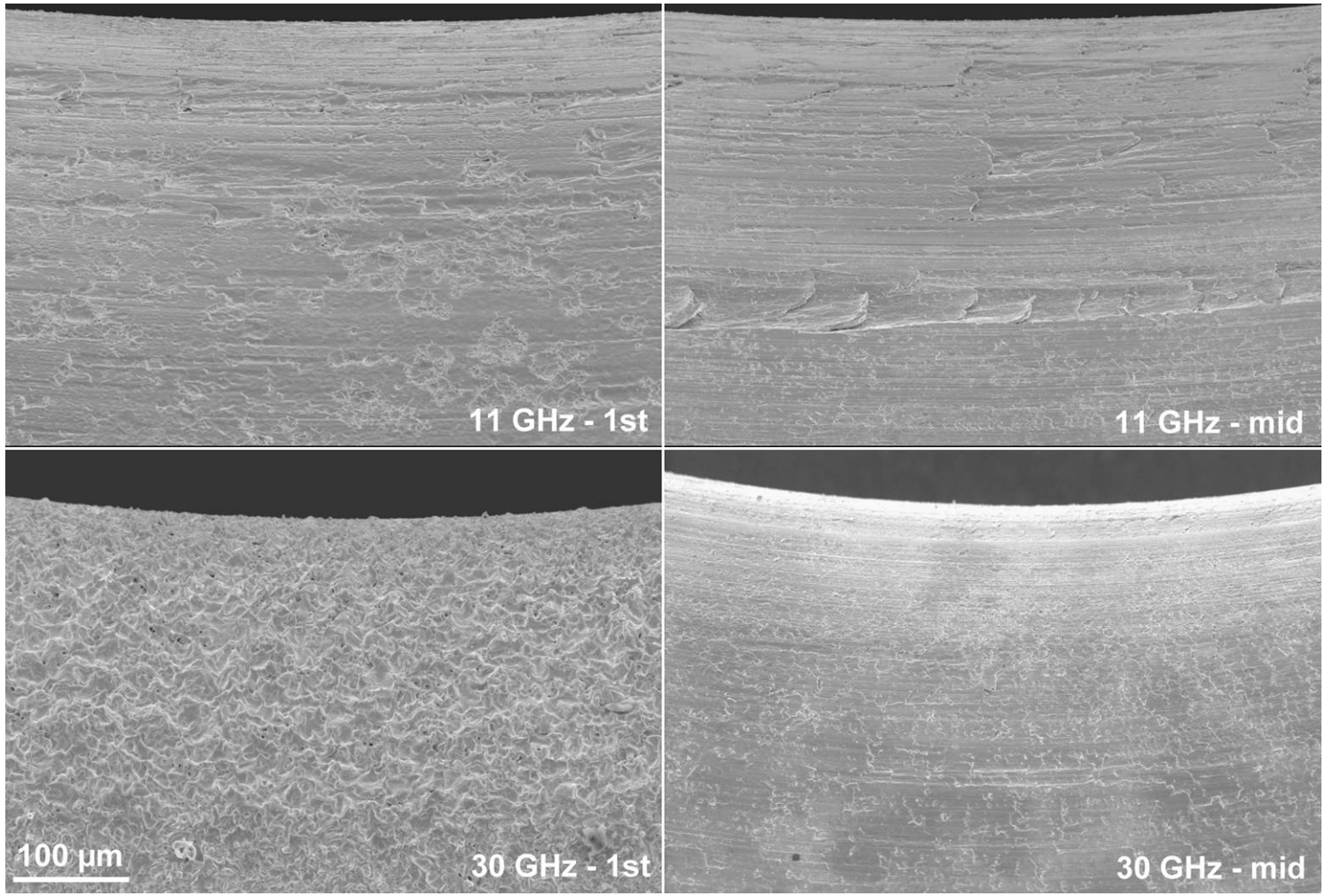


Plus all of NLCTA behind – Power source, high-gradient instrumentation, conditioning control system

Conditioning history



State of surfaces after conditioning



Inside radius of iris, location of highest surface electric field

- 85 MV/m accelerating gradient (first cell) but power limited for 16/25/30 ns
- Only 65 MV/m accelerating gradient (first cell) for 100 ns pulse after 500 h conditioning but
- Conditioning curve not saturated and microscopic images indicate early stage of conditioning
- 30 GHz structure required about 500,000 breakdowns to condition, X-band structure saw only about 100,000
- Improved surface and bulk to be investigated to speed conditioning
- Next test will be 30 GHz long pulse in CTF3