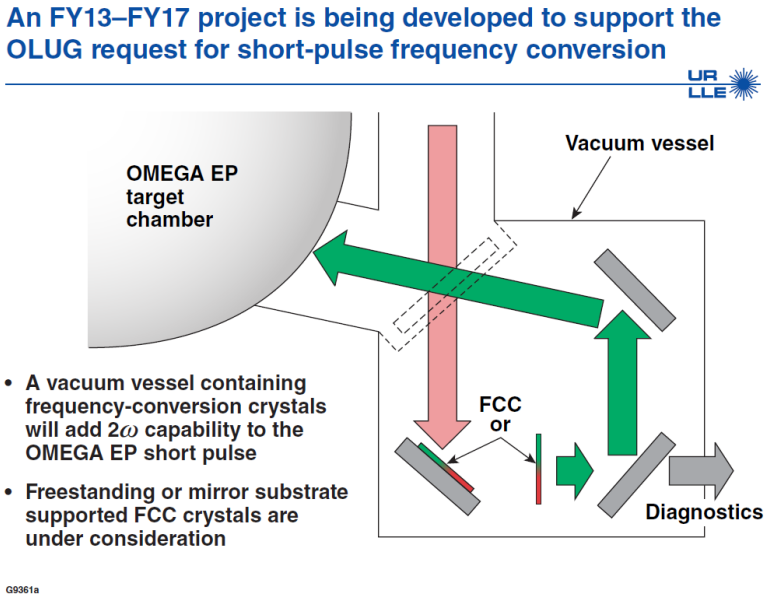
Bringing Omega EP performance up to full specification and 4ω probe utilization

Already covered in overview talk

- Improvement of focal spot size
  - Static wavefront corrector installed in both B1 and B2
  - Currently gathering data on focal spot - showing significant improvement, but not yet quantified
- Cross-beam timings
  - More reliable, more pre-shot monitoring systems have been installed
  - 100ps UV pulses are activated – long-to-long pulse timings can be better calibrated
- Nanosecond contrast (currently 10^{-8})
  - Should be significantly improved in coming months with new OPA front end that is replacing old system
  - Expect 2 orders of magnitude improvement by summer 2012
- Beam 1 energy increase (B-integral problem for the diagnostics table)
  - Longer term project (>12 months), but plan a full aperture filter for diagnostics table. This is a difficult problem.
- Intermediate pulse widths
  - Hard problem to fix (longer term) but there is ongoing work to improve pulse-length diagnostics
- A beam combiner
  - Has been installed and are planning to learn how to use it in upcoming maintenance time
  - Capability for extremely modest focal spot separations, and probably astigmatic focal spots
- 2ω or 3ω conversion of the PW beam
  - Conceptual at the moment, but being written into new cooperative agreement
- 4ω probe status
  - Making progress, probably available in the 3rd quarter of FY12

Scientific motivation for conversion of a PW beam to 2ω (or 3ω)



- Improves contrast
  - Very important for thin foil target experiments (ion acceleration)
  - Important for high-harmonic generation experiments
- Access higher densities
  - n_c 4 times higher for 2ω compared with ω
- Need to understand wavelength scaling for hot electron production
  - Relevant to fast ignition – several talks in this afternoon session:
    - J06.00004 Characterization of MeV Electron Generation using 527 nm Laser Pulses for Fast Ignition (R Fedosejevs et al.)
    - J06.00006 Wavelength effects on hot electron generation at relativistic intensities (A Link et al.)
    - J06.00007 Conversion efficiency and electron temperature from cone-wire targets at ω and 2ω (D Higginson et al.)