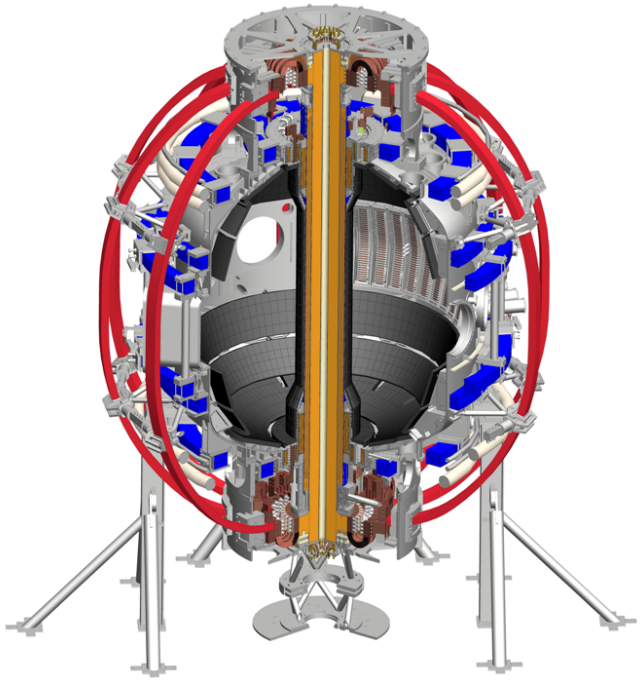
Using 2D BES measurements to resolve the in-situ HHFW wavefield



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Resolving the in-situ HHFW wavefield

- The Phaedrus-T tokamak demonstrated direct observation of RF wavefields with BES measurements
- Running two ICRF antennae at slightly different frequencies results in a local density perturbation at the beat frequency, which falls in the BES detection range
- Here, we seek to demonstrate 2D imaging of the HHFW density field on NSTX-U with BES measurements. The 2D BES system samples at a 1 MHz Nyquist frequency, so the measurement requires tuning the RF sources with a ~10 kHz offset (or as high as possible) to enable observations at the beat frequency. BES measurements will require either NBI "blips" or continuous injection.
- If successful, this technique can drive new experimental efforts for HHFW model validation.
- Addresses R16-3 for fast-wave core heating and 5 yr priority for non-inductive operation