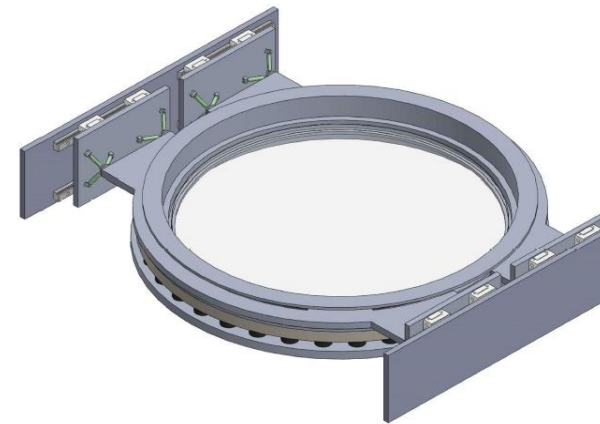


# A polarization modulator for CMB S4 Continuously Rotating Cryogenic HWP

- HWP modulator for S4 has to be cold
  - Wide band requires multi-stack AHWP. → large thermal load if warm.
- SC bearing (developed by EBEX)
- Larger and thus heavier HWP (~20kg)
- Robustness for years of operation
- Rejection of atmosphere and ground
- Prototype R&D at LBNL
  - Based on experience with ABS
    - See Tom's slide
  - Operation at 4K-50K.



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