



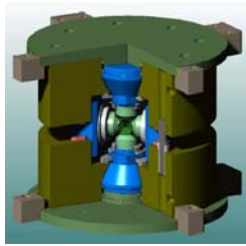
# Effect of water in high pressure and high temperature deformation of olivine single crystal

J. GIRARD, J. CHEN, P. RATERRON, C. W. HOLYOKE



## D-DIA coupling with X-Ray synchrotron beam

D-DIA press:



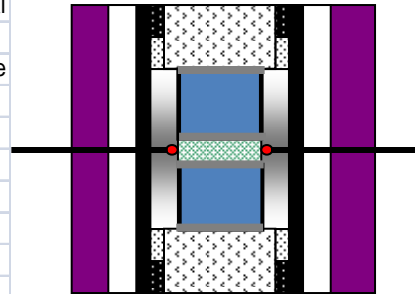
Deformation-DIA (D-DIA)

Wang et al. (2002)

(courtesy B. Durham)

D-DIA cell:

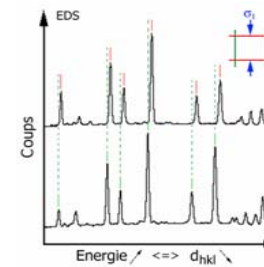
- Single crystal
- Al<sub>2</sub>O<sub>3</sub>
- carbon sleeve
- carbon rings
- BN
- Talc\*
- Al<sub>2</sub>O<sub>3</sub>
- polycrystal
- Rhenium foil
- Boron epoxy



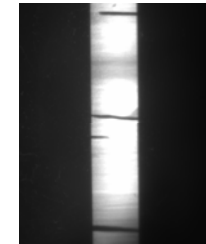
\*For "dry" experiments we used alumina sleeve  
For "wet" experiments we used talc sleeve

X-ray measurement:

insitu X-ray diffraction powder



In situ X-radiography



## Deformation regimes studied

P (GPa)	T (K)	$\sigma$ (GPa)
4 < P < 8	1473	0.21 < $\sigma$ < 0.66

## Water content (FTIR estimation measurements)

P (GPa)	T (K)	Water content (ppm)*
7	1473	1030±60
4	1473	240±10

