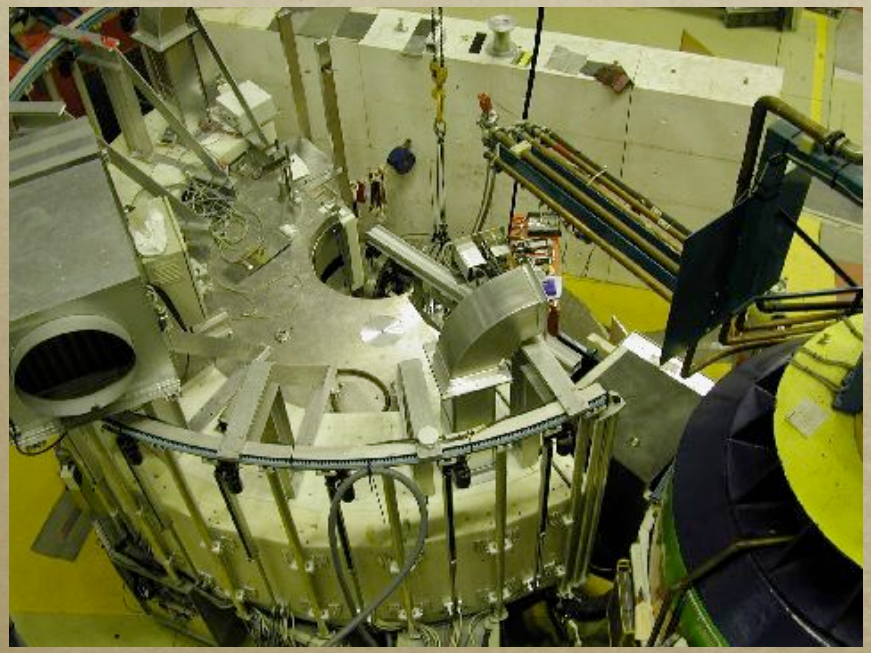
# Rietveld analysis with Maud: the absorption case and Hippo

*Luca Lutterotti & Rudy Wenk*

# The Iceman copper axe

- *Texture to understand manufacture*
- *How to get the texture?*

# Measurement at ILL-D20

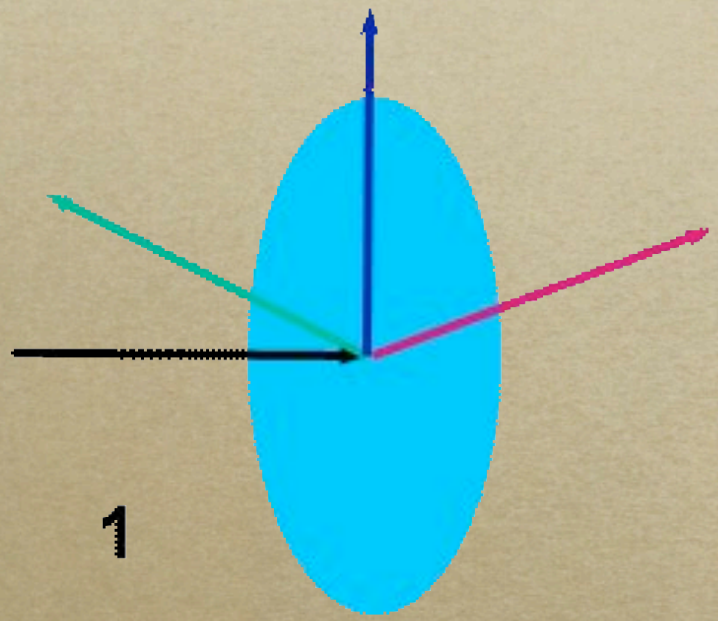


- *The axe mounted*

# How to deal with absorption

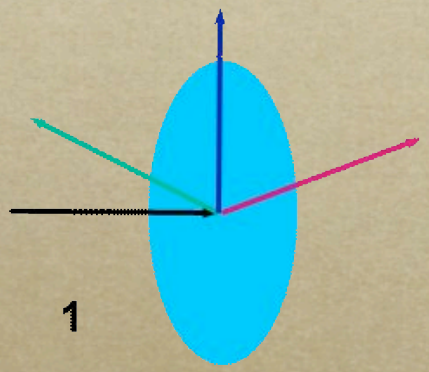
- *In Maud:*
  - *Sample shape described by the Popa harmonic expansion developed for crystallites*
  - *Two models for integrating the absorption path:*
    - *Analytical approximated model*
    - *Discretization in cells*
  - *Problems:*
    - *Discretization is slow + border problem*
    - *Approximation requires one adjustable parameter + velocity problem*

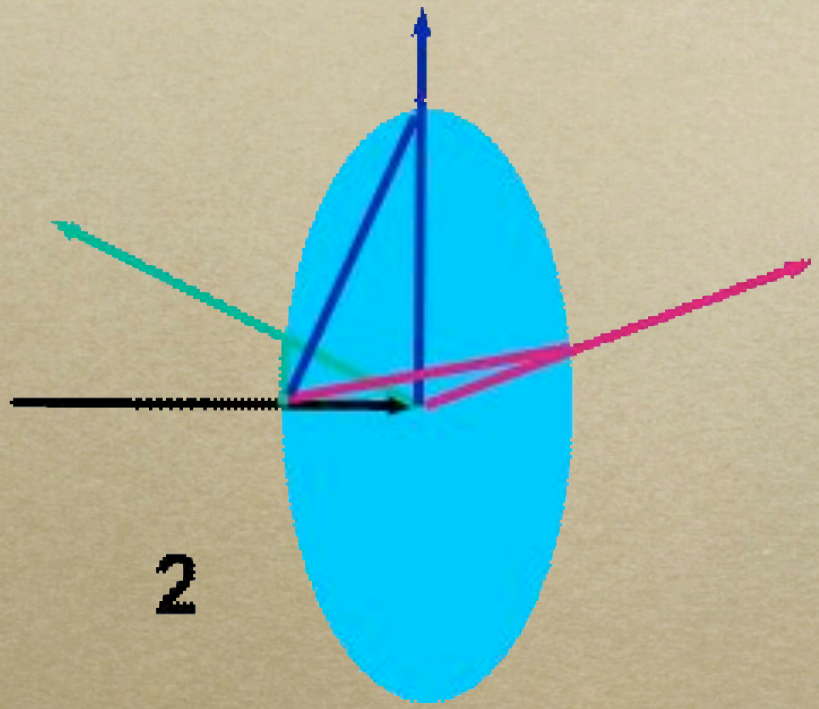
# The analytical approximation




- $A = e^{-\mu x}$ *what could be x*

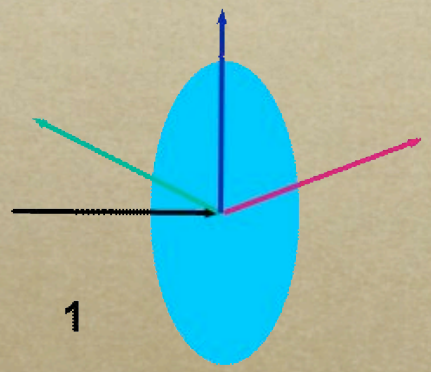
# The analytical approximation

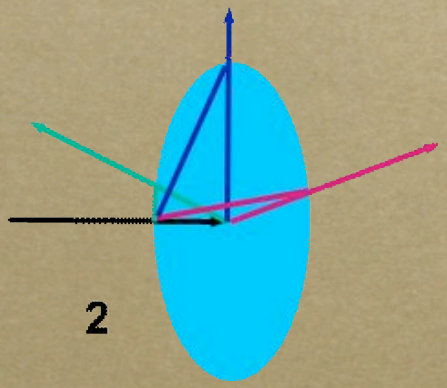


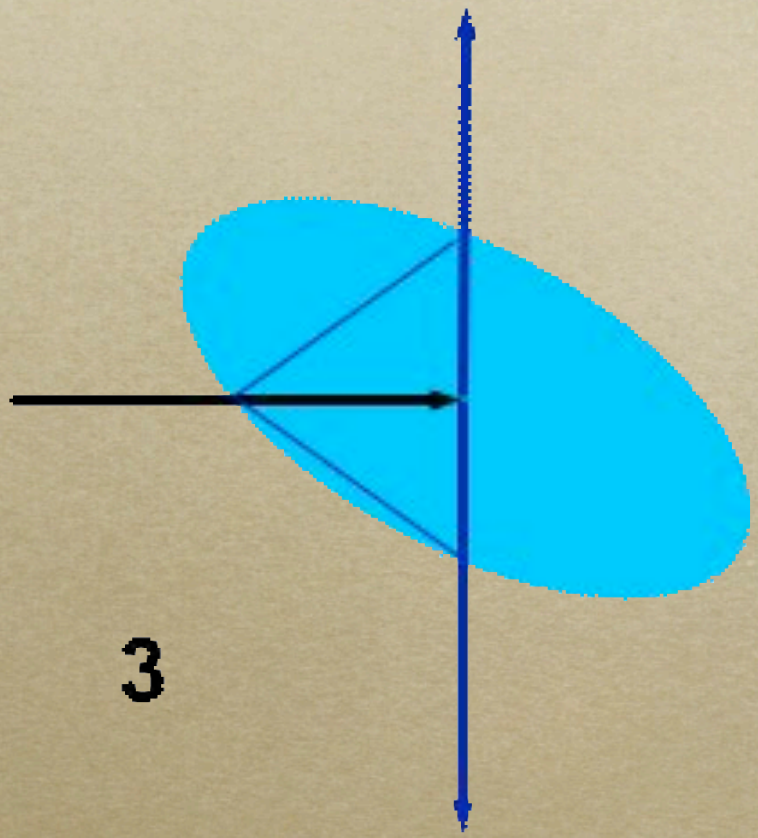




$A = e^{-\mu x}$ *what could be x*

# The analytical approximation

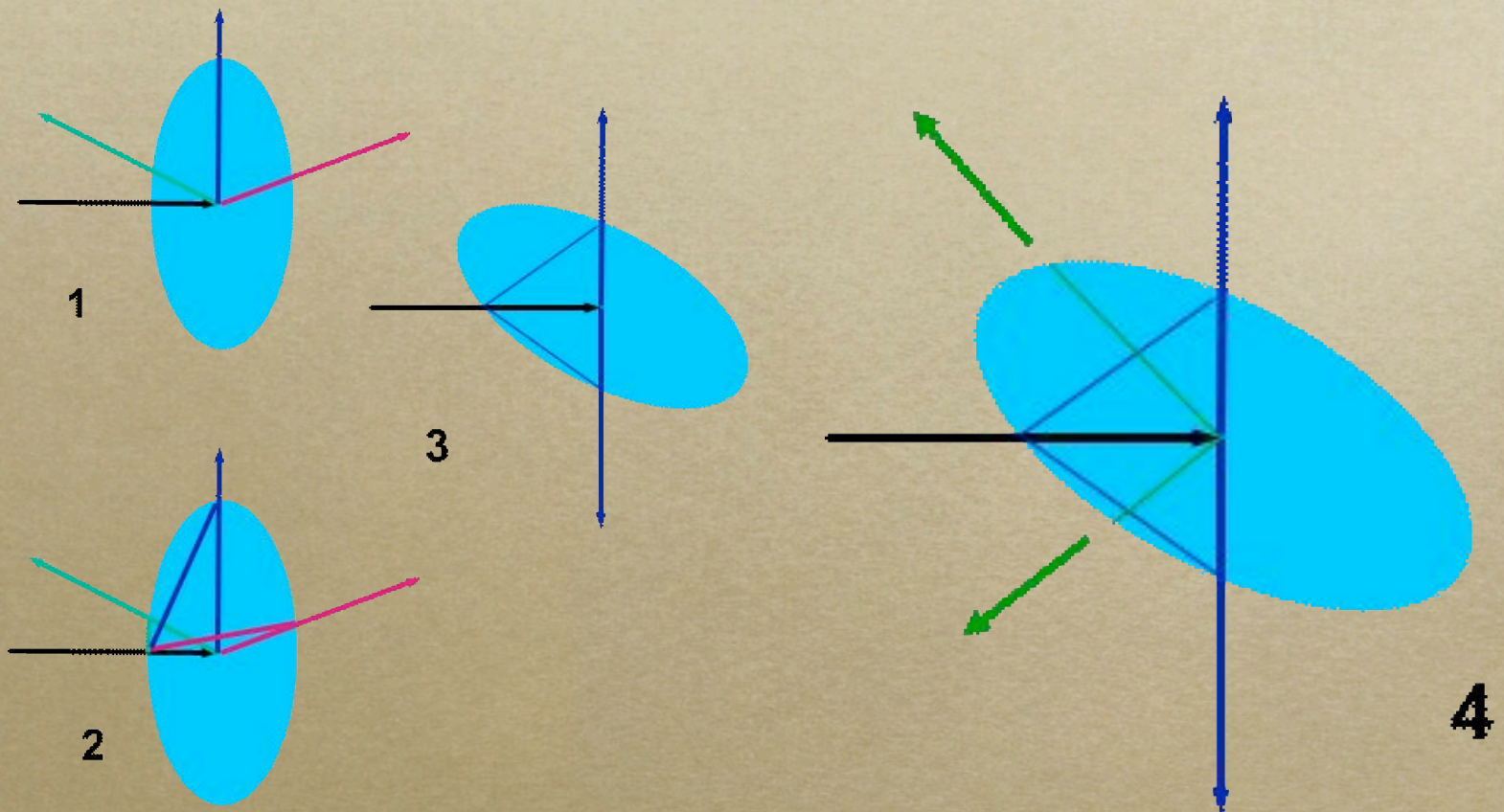


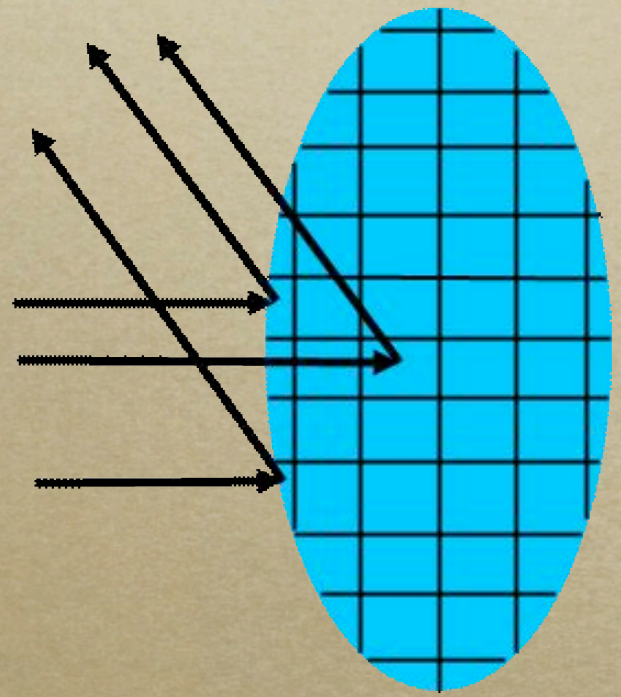

$A = e^{-\mu x}$ *what could be x*

# The analytical approximation



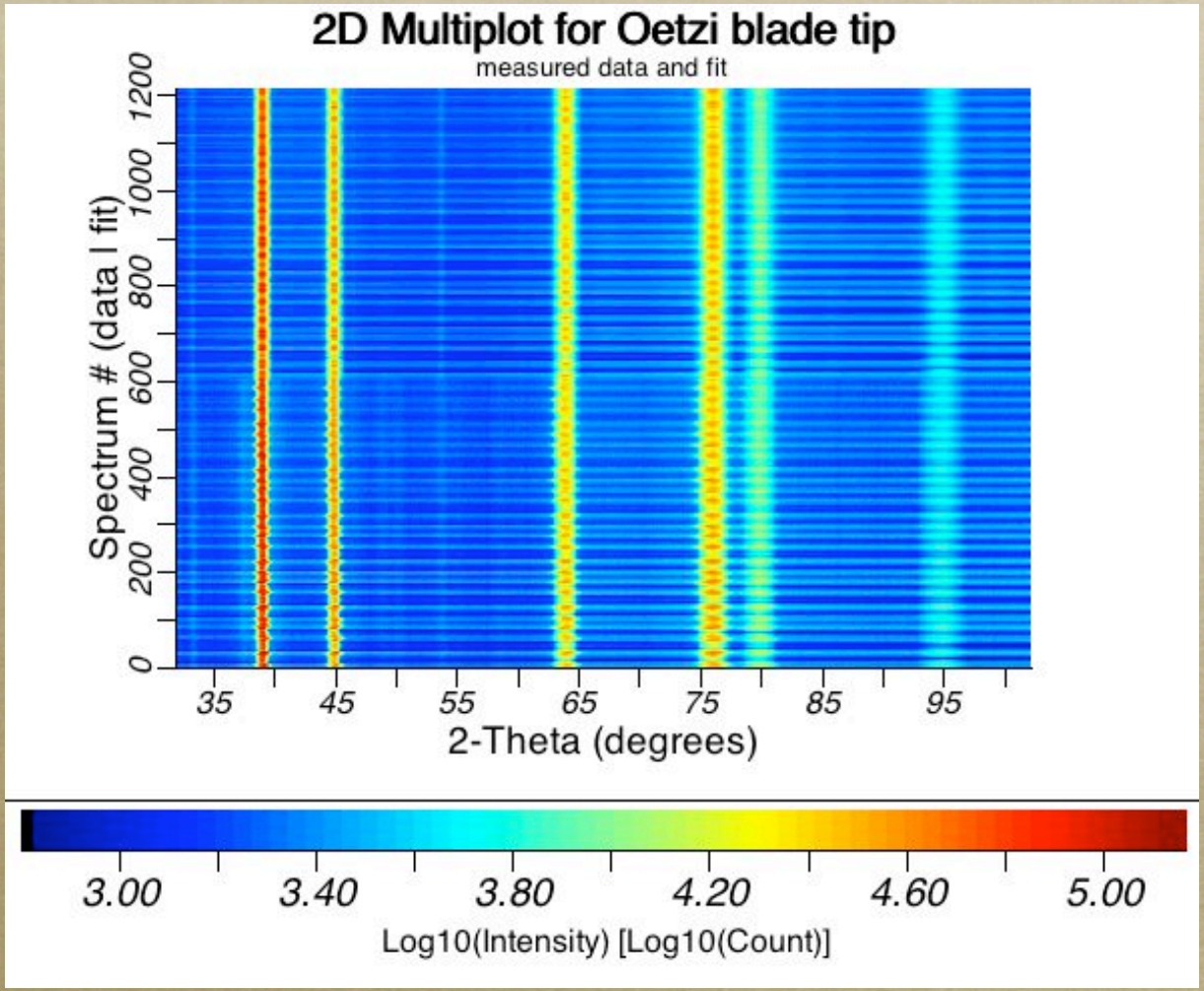

$A = e^{-\mu x}$ *what could be x*

# Discretization

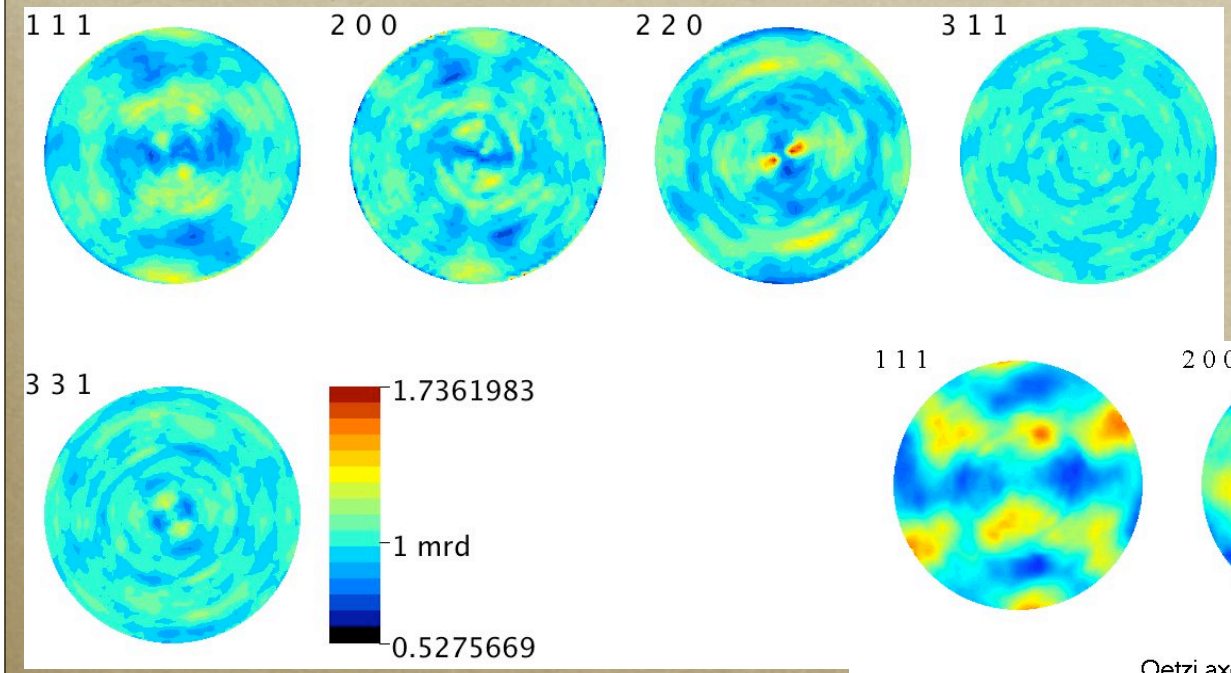


- *Problems on the cells at the border*
- *Integration is slow*

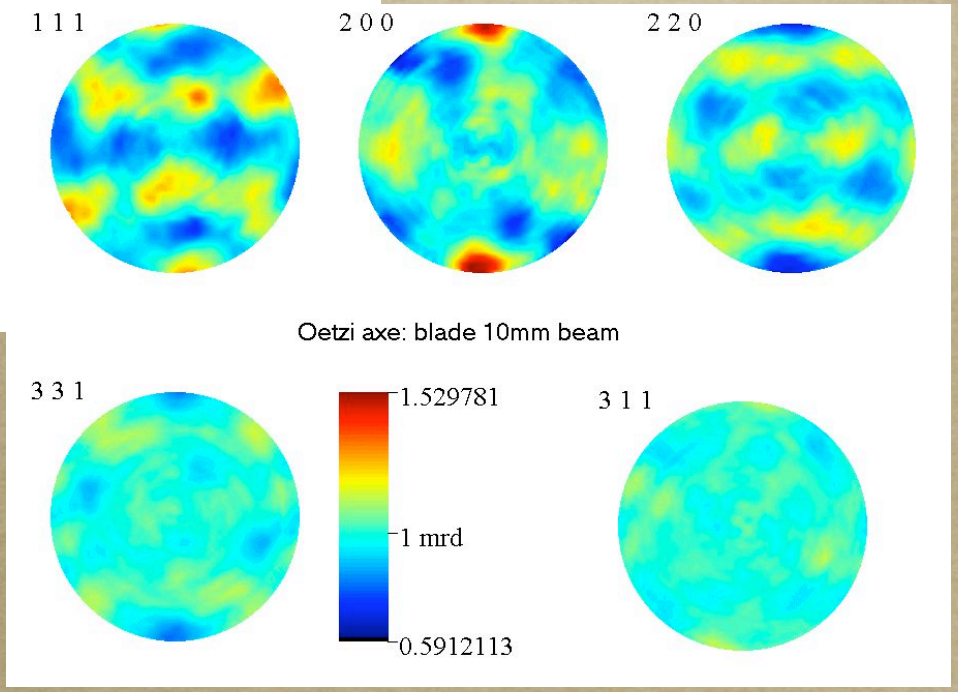
# The spectra measured and fitted



# The Iceman axe texture

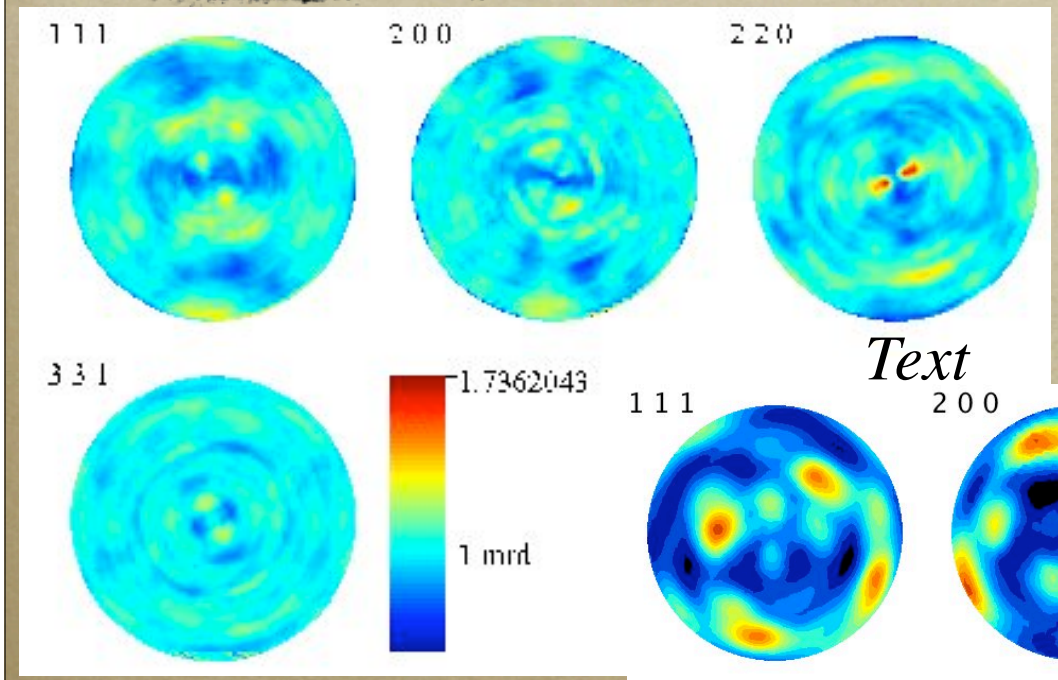



*Absorption*

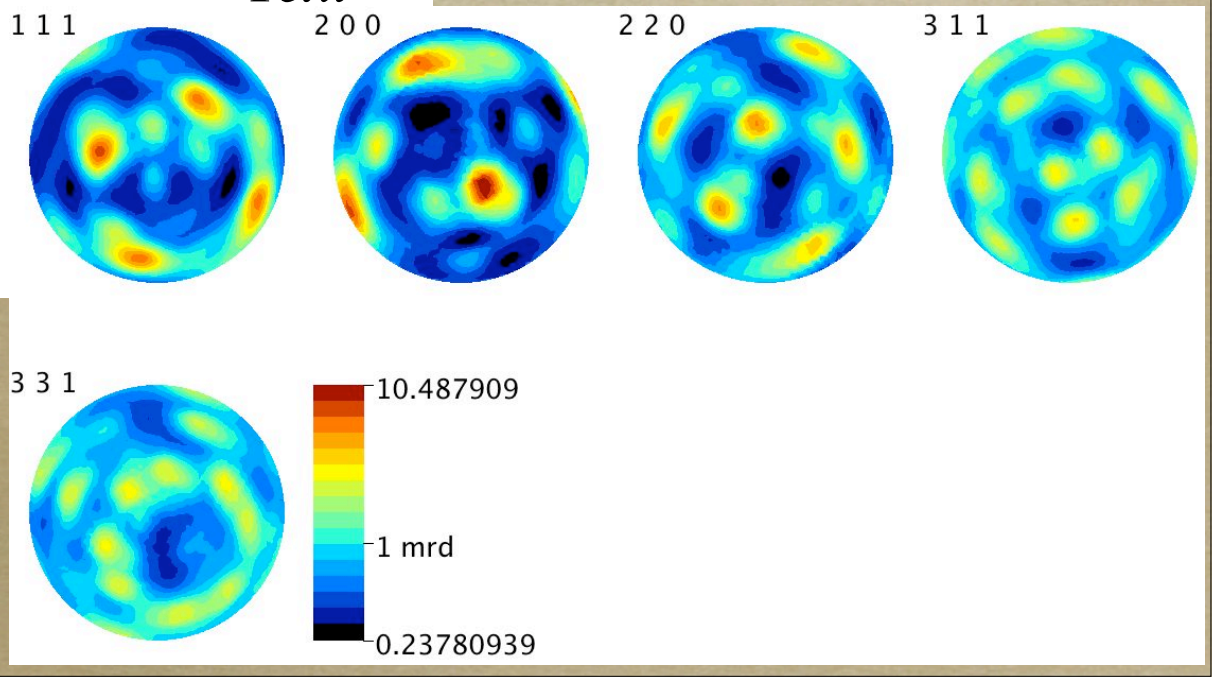



*No absorption*

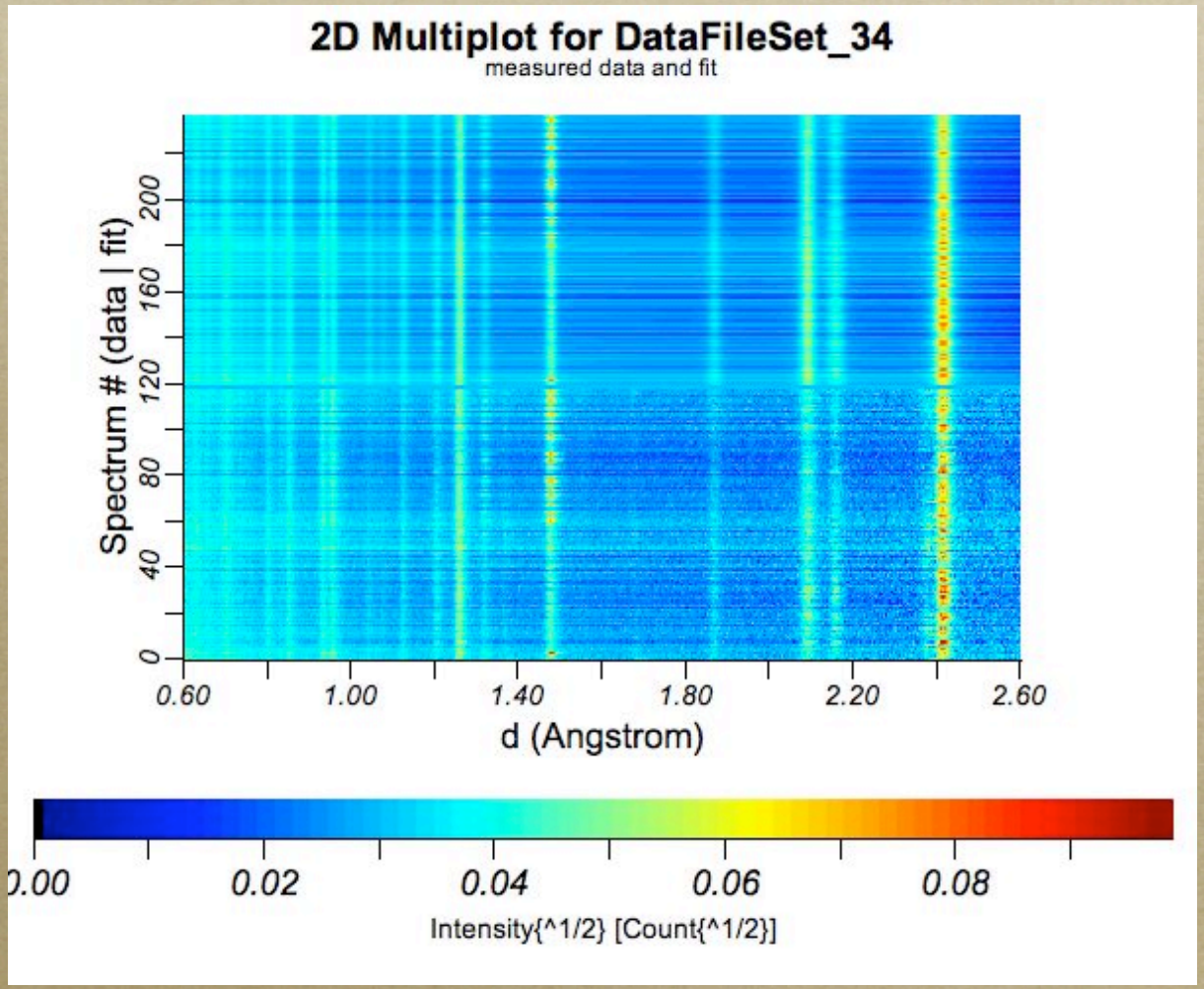
# The Iceman vs. Castelrotto axes




*Text*

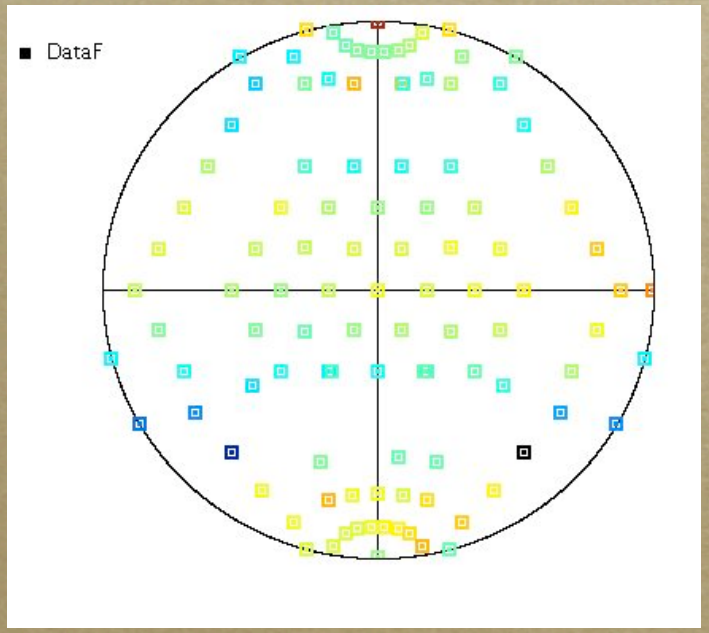


# The coin case (HIPD) by Maud

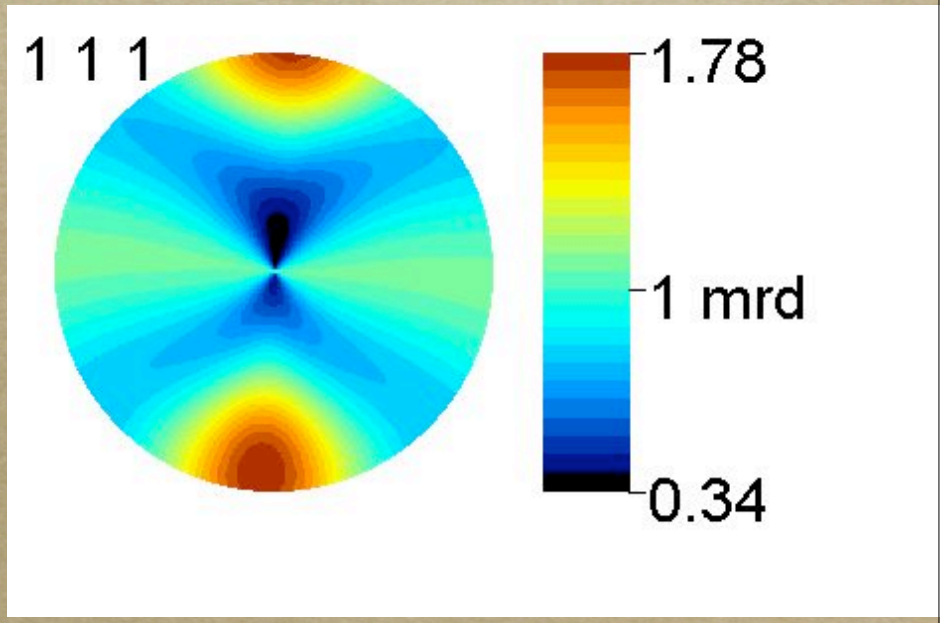


# The coin case (HIPD)

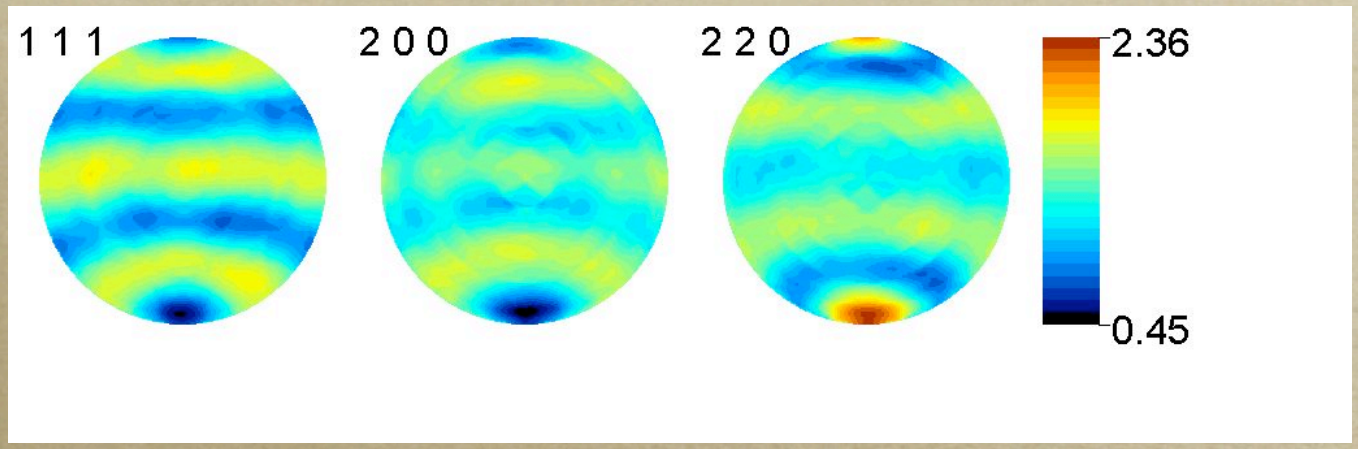
*- coin 2B*
*- Bank 3 and 4*
*- Scale factor refined and plotted by thermal colors*



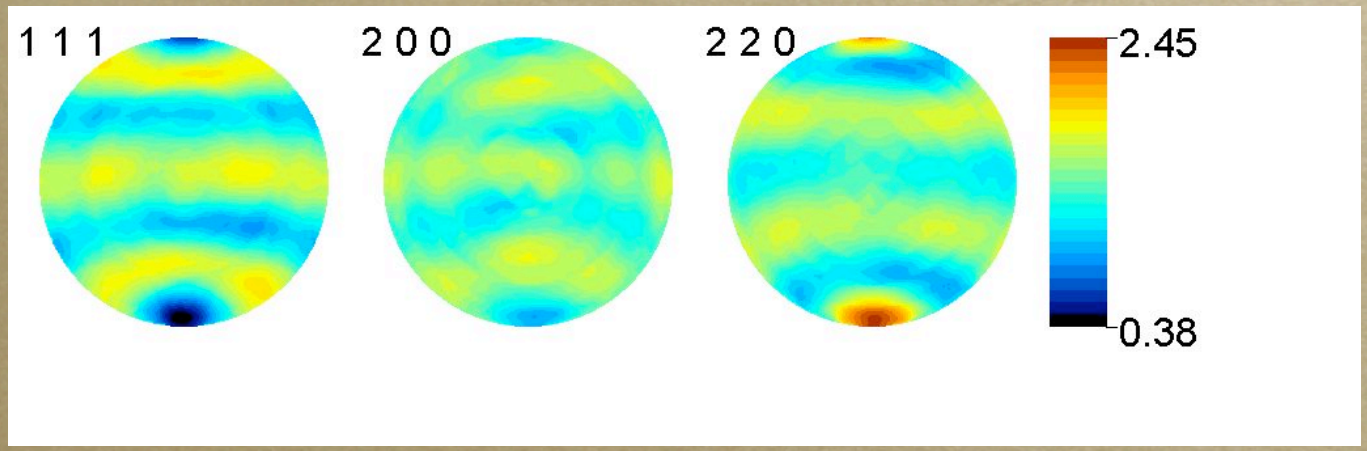

*-Absorption correction by the analytical approximation*
*- cylindrical shape*
*-Slightly better fitting (< pars)*
*- 90° bank plotted*



# Coin: reconstructed pole figures




*Silver*

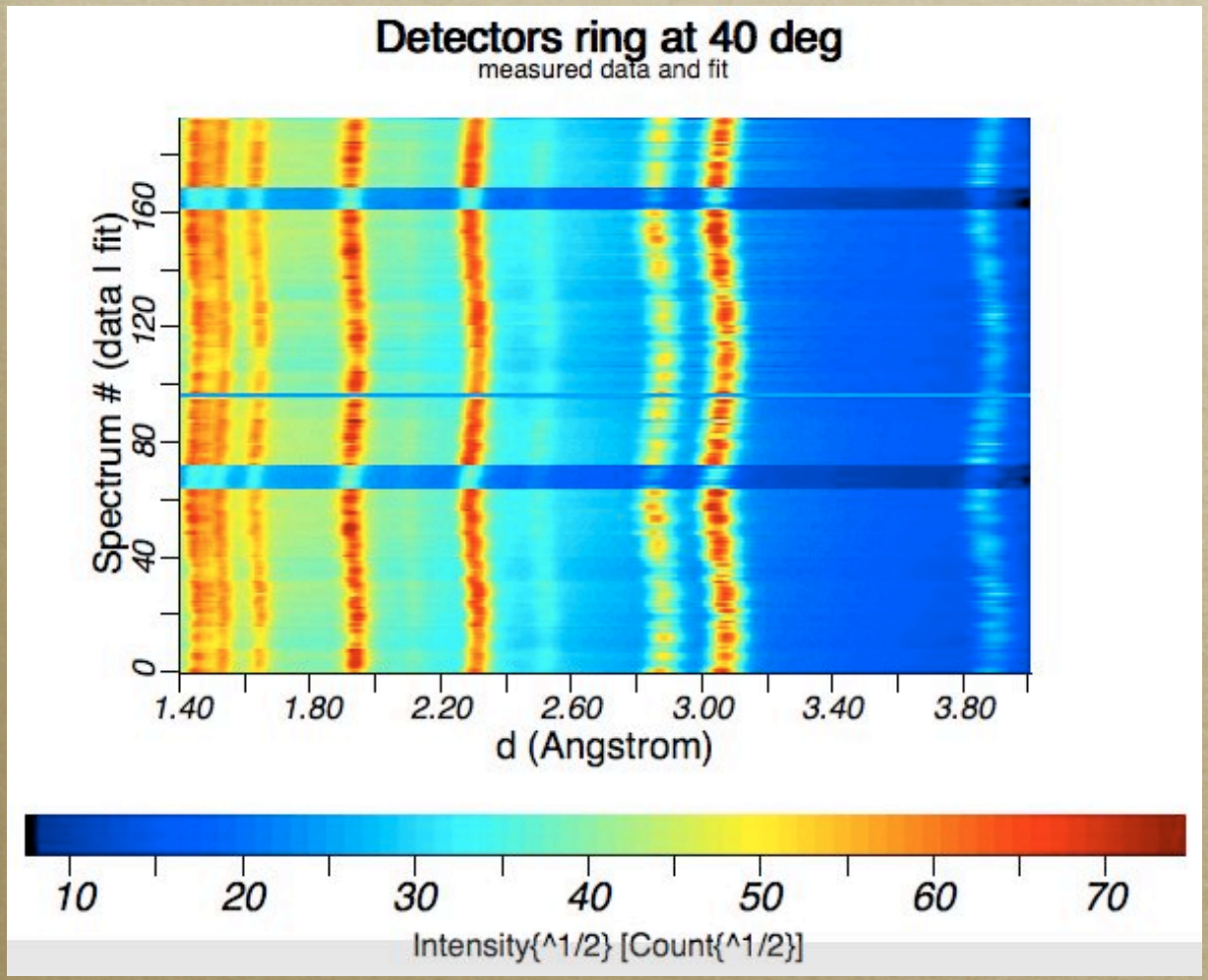



*Copper*

# Hippo

- *Early measurements and some problems:*
  - *Intensities changing by rotation and in time*
  - *Peak positions changing also*

# Modeling the problems in Maud

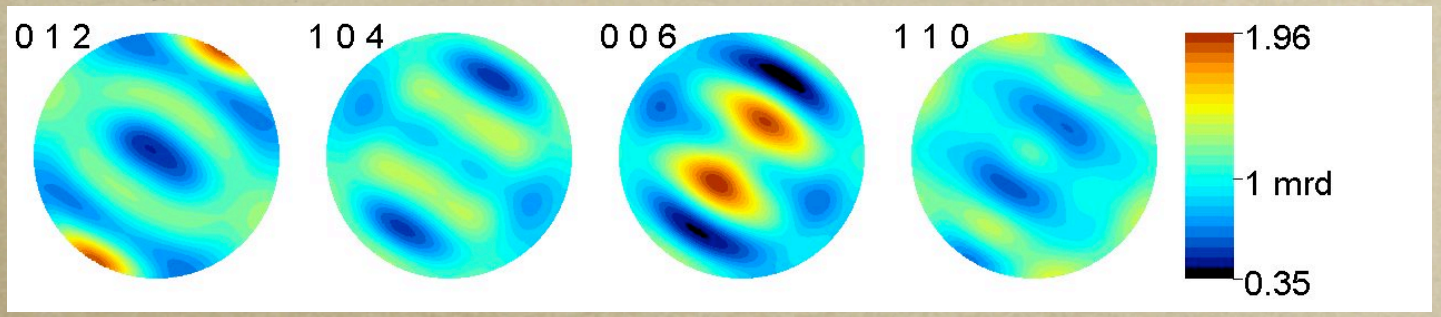



- *Limestone standard*

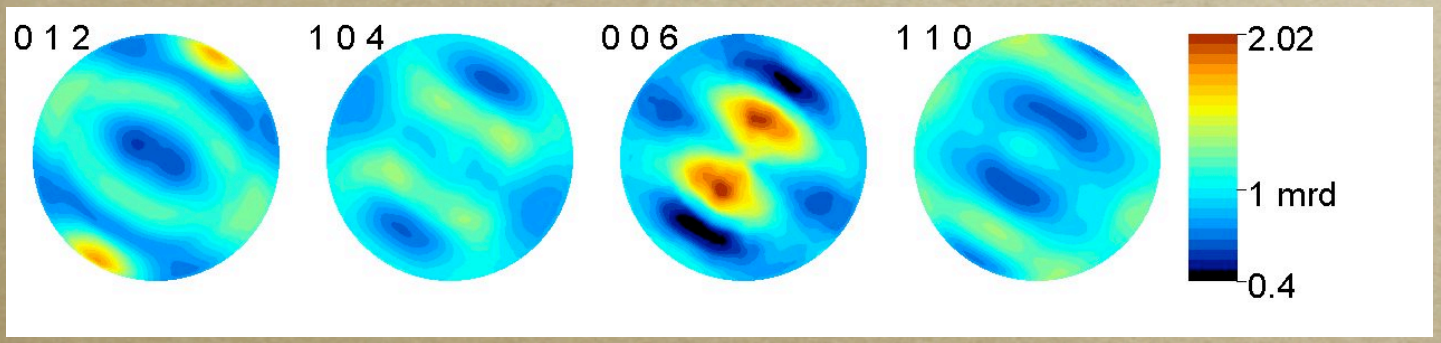
- *Precession error*

- *Sample position*

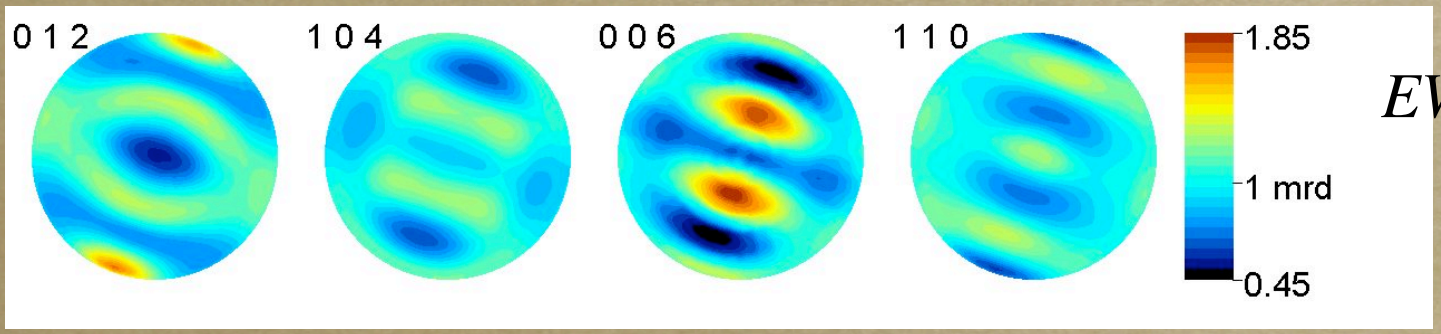
# The pole figures of limestone




*Harmonic*




*EWIMV*




*EWIMV at D20*