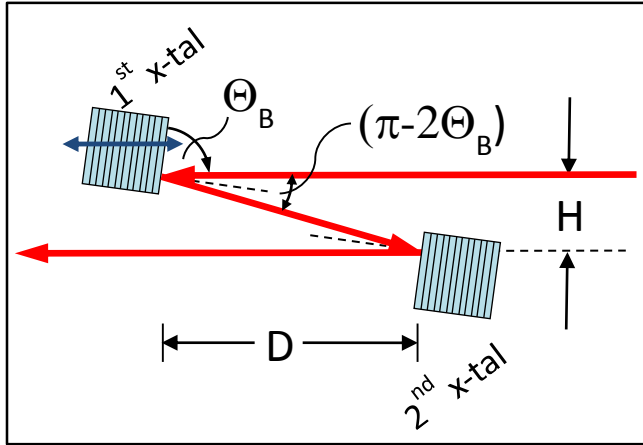


## High-resolution monochromator in channel-cut geometry

(T. Gog, 06/08/2017)

### Geometry

Beam offset H is fixed and kept constant by moving the first crystal horizontally



H : Beam Offset

D : Distance between crystal surfaces

E : Incident Energy [keV]

$\Theta_B$  : Bragg angle [°]

d : diffraction plane spacing [Å]

hc : 12.39841904 keV Å

$$\Theta_B(E) = \text{ArcSin}\left(\frac{hc}{E \cdot 2d}\right) \Leftrightarrow \frac{hc}{E} = 2d \sin \Theta_B$$

$$D(E) = \frac{H}{-\tan(2\Theta_B(E))} \Leftrightarrow \tan(\pi - 2\Theta_B) = -\tan(2\Theta_B) = \frac{H}{D}$$

### Ir L<sub>III</sub> Edge: E=11.215 keV

Nominal Energy E<sub>i</sub> (Ir L<sub>III</sub> edge)

11.215 keV ( $\lambda_0 = 1.1055 \text{ Å}$ )

Si(8,4,4): Nominal Bragg Angle  $\Theta_B$

85.7271° @ 11.215 keV

diffraction plane spacing d:

0.55430124 Å

Beam Offset H:

5 mm