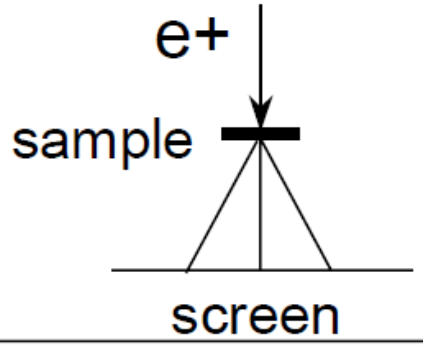
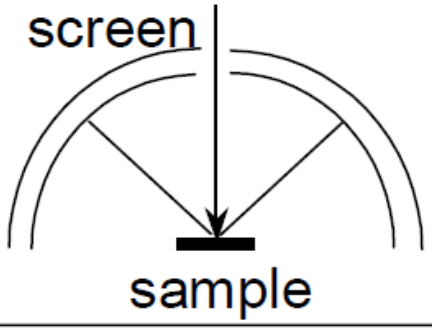
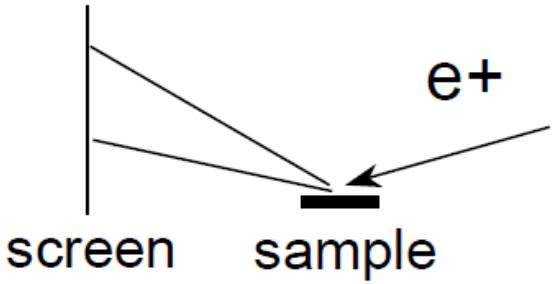
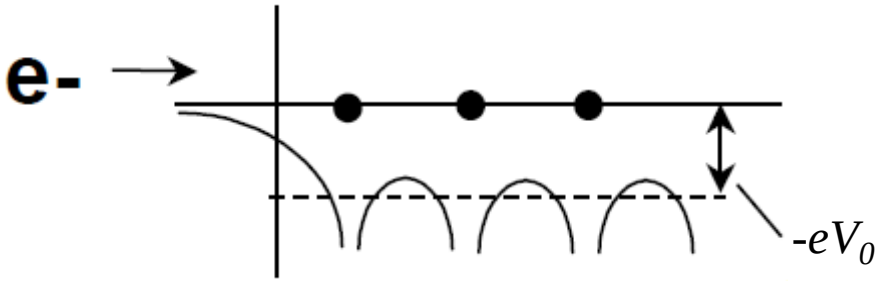
Difrakce pozitronů

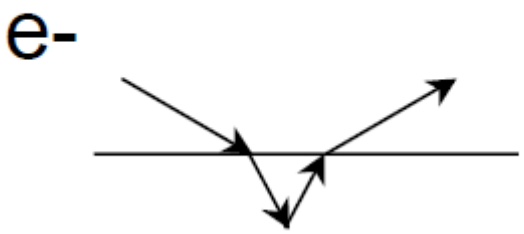
• **difrakce pozitronů**

		
TPD **T**ransmission **P**ositron **D**iffraction	LEPD **L**ow **E**nergy **P**ositron **D**iffraction	**RHEPD** **R**eflection **H**igh **E**nergy **P**ositron **D**iffraction
100keV ▪ 1MeV	10 ▪ 500eV	10 ▪ 100keV
Bulk ▪ Study	▪ **Surface** ▪ **Study** ▪	

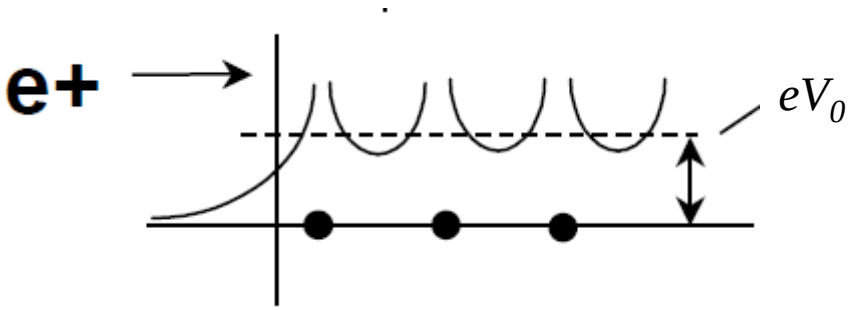
RHEPD = Reflection High-Energy Positron Diffraction

- **RHEED**
- potenciál pro elektrony
- negativní vnitřní potenciál





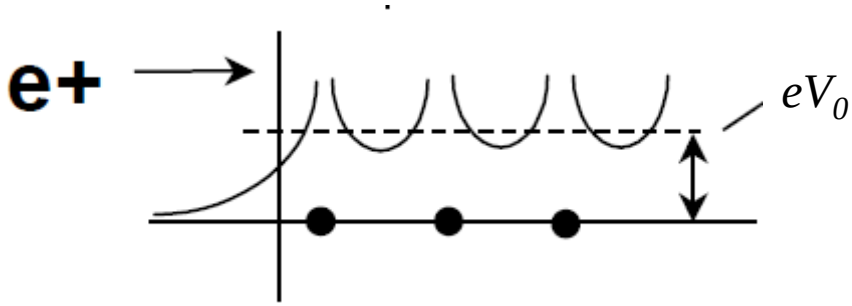
- **RHEPD**
- potenciál pro pozitrony
- pozitivní vnitřní potenciál



RHEPD = Reflection High-Energy Positron Diffraction

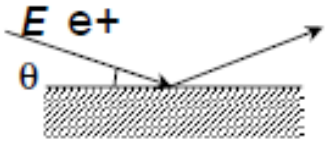
• **RHEPD**

$$\left(-\frac{\eta}{2m}\nabla^2 + eV\right)\psi = E\psi$$



• mimo krystal $V = 0$

• uvnitř krystalu $V > 0$

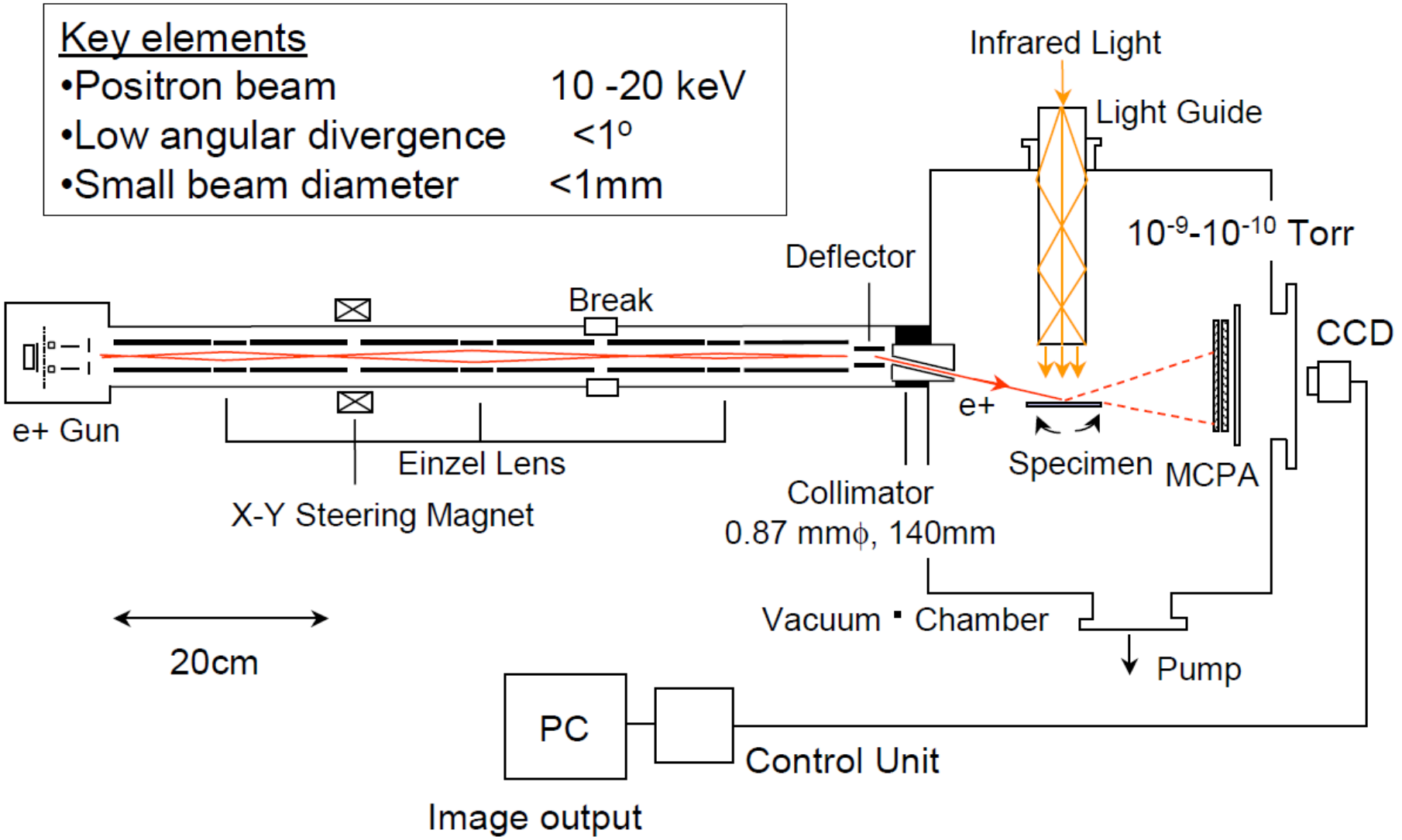


• **totální reflexe pozitronů**

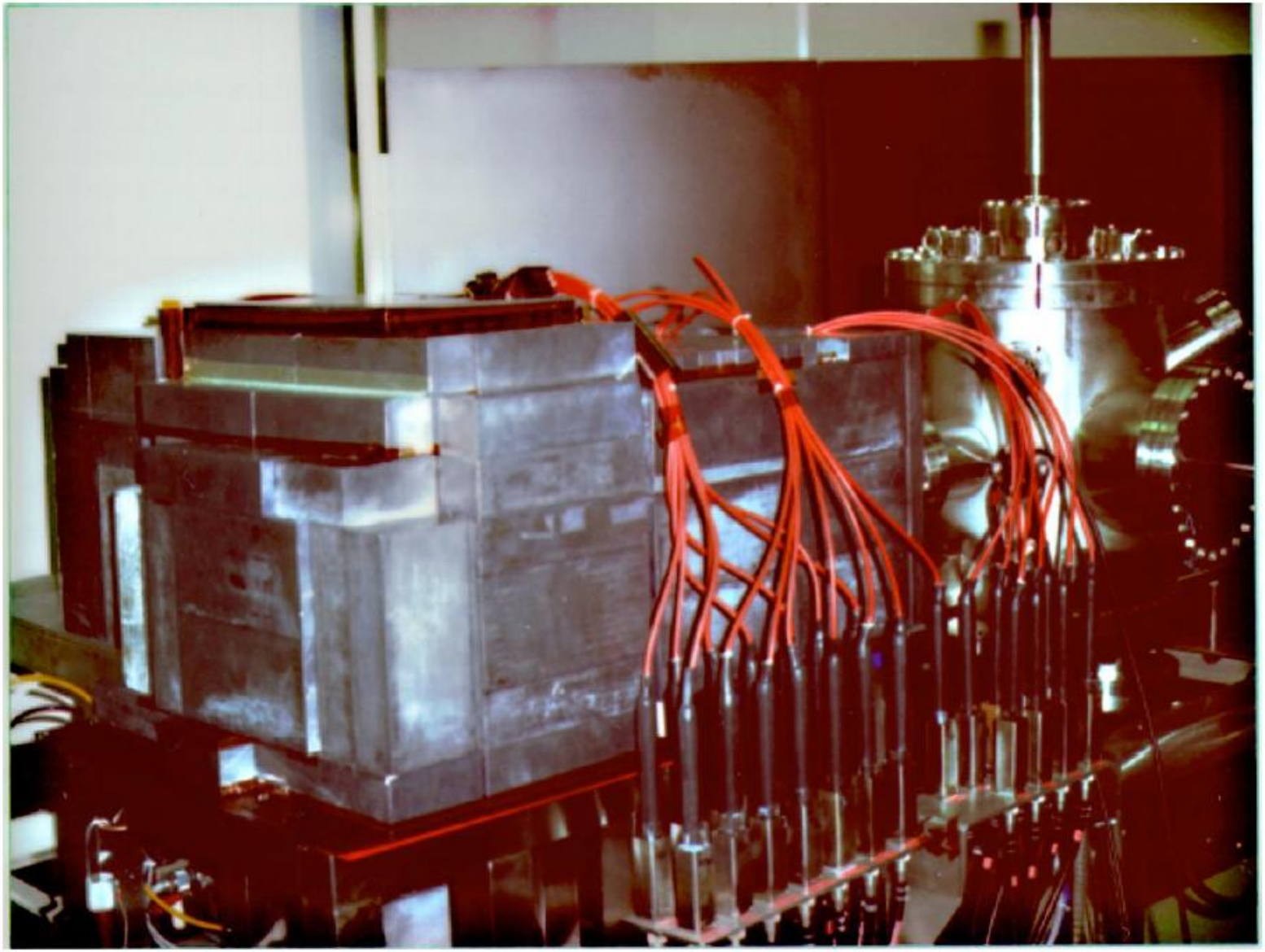
$$E_0 \sin^2\theta = eV \quad \Rightarrow \quad \theta = \arcsin\sqrt{eV / E_0}$$

kinetická energie e^+

RHEPD = Reflection High-Energy Positron Diffraction

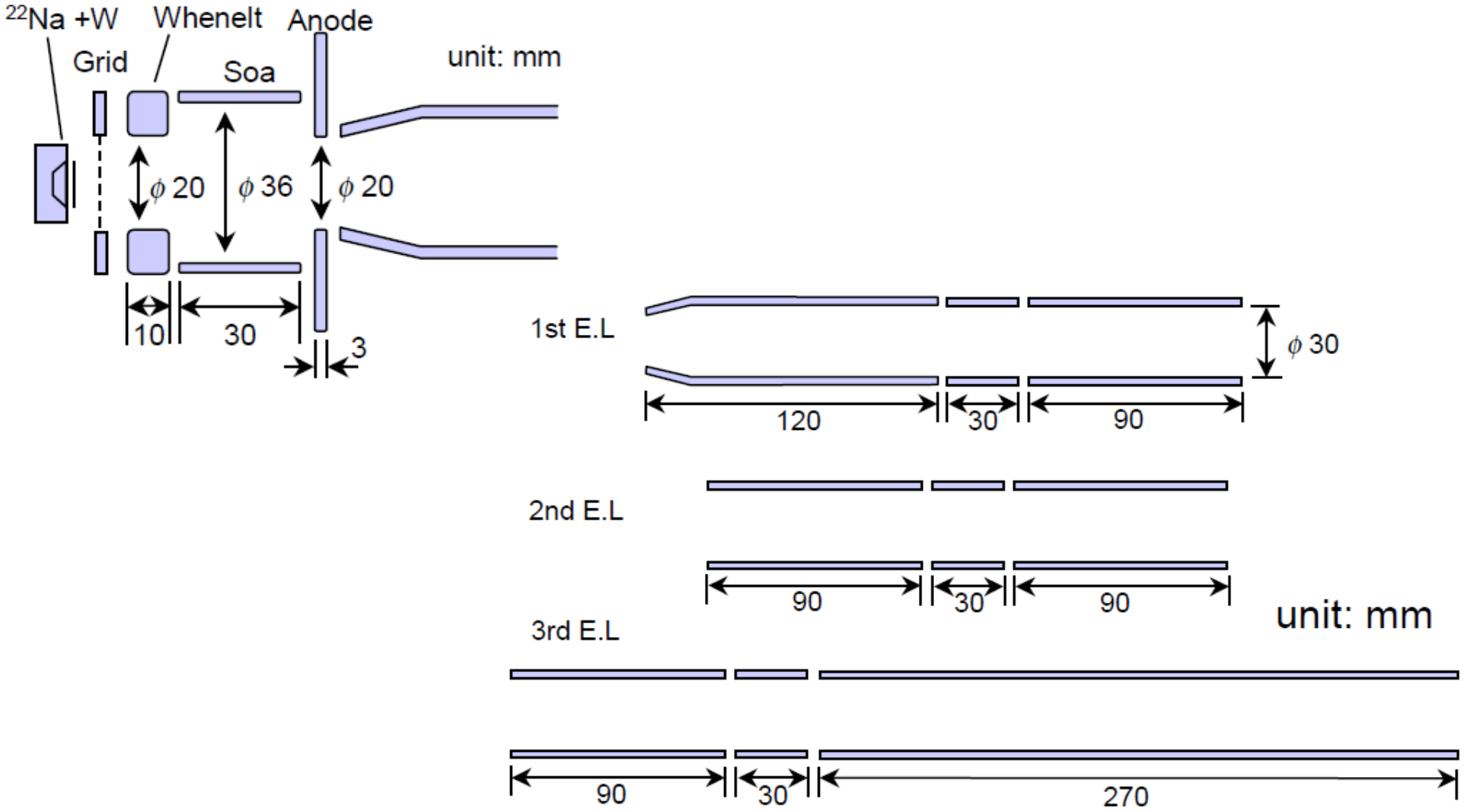


RHEPD = Reflection High-Energy Positron Diffraction



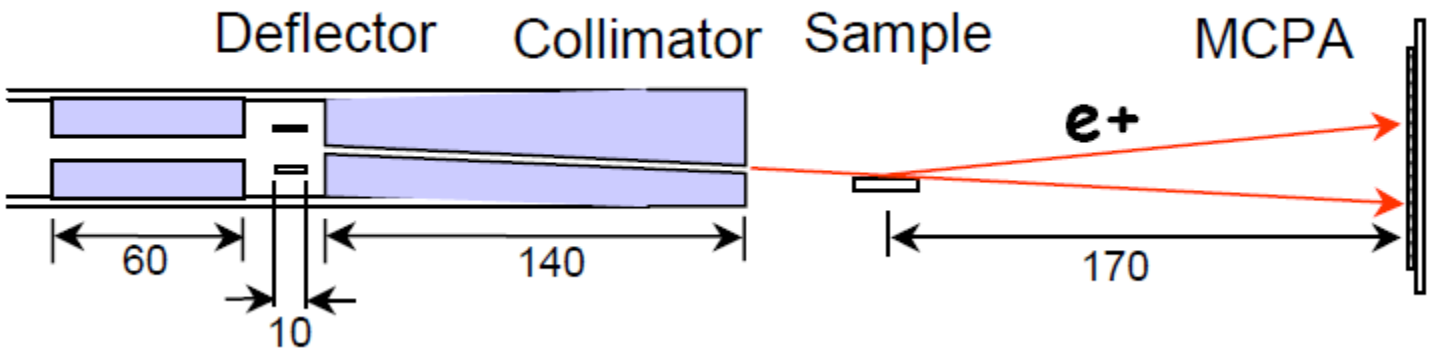
RHEPD = Reflection High-Energy Positron Diffraction

- **elektrostaticky vedený svazek**



RHEPD = Reflection High-Energy Positron Diffraction

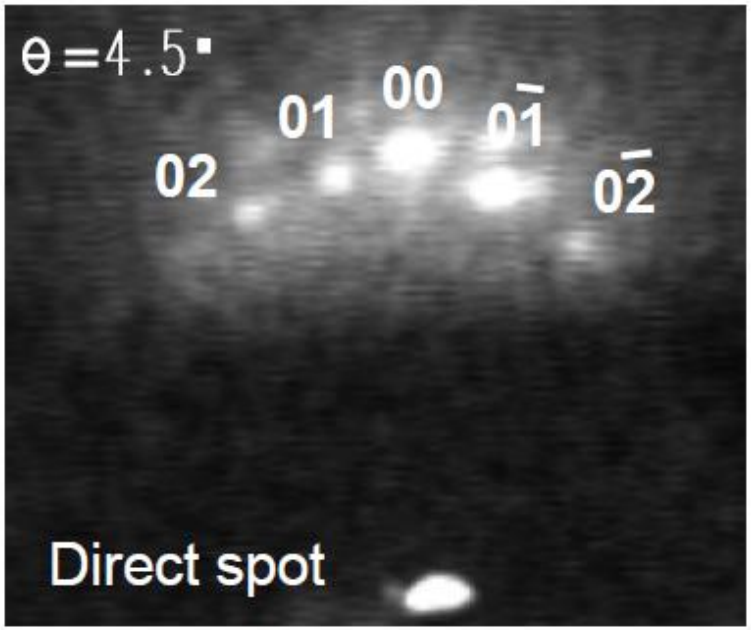
- **elektrostaticky vedený svazek**



RHEPD = Reflection High-Energy Positron Diffraction

- **Si (111) H**

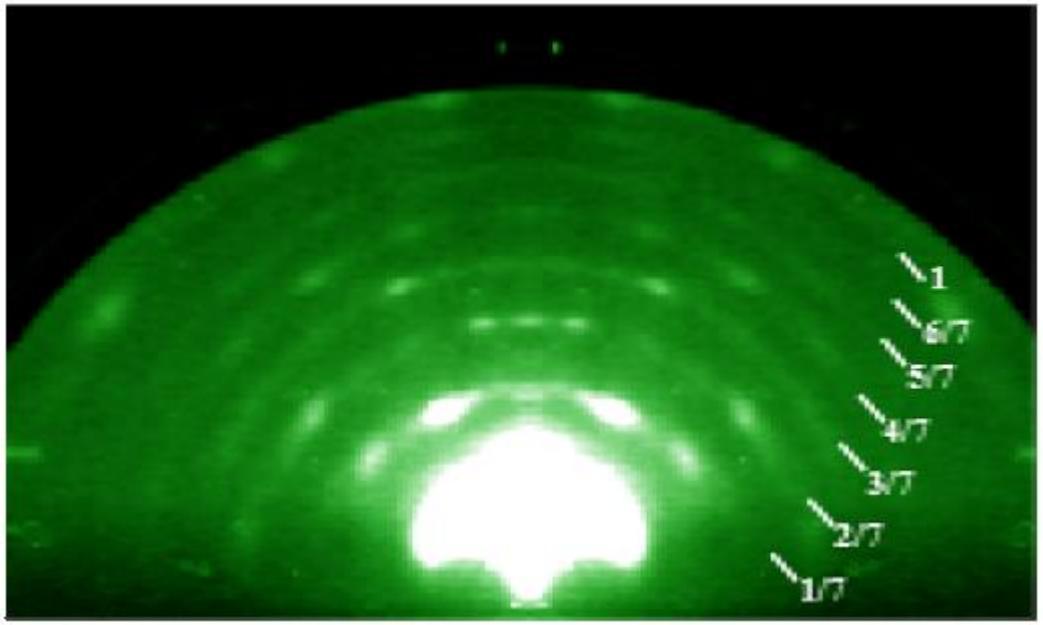
RHEPD



RHEED

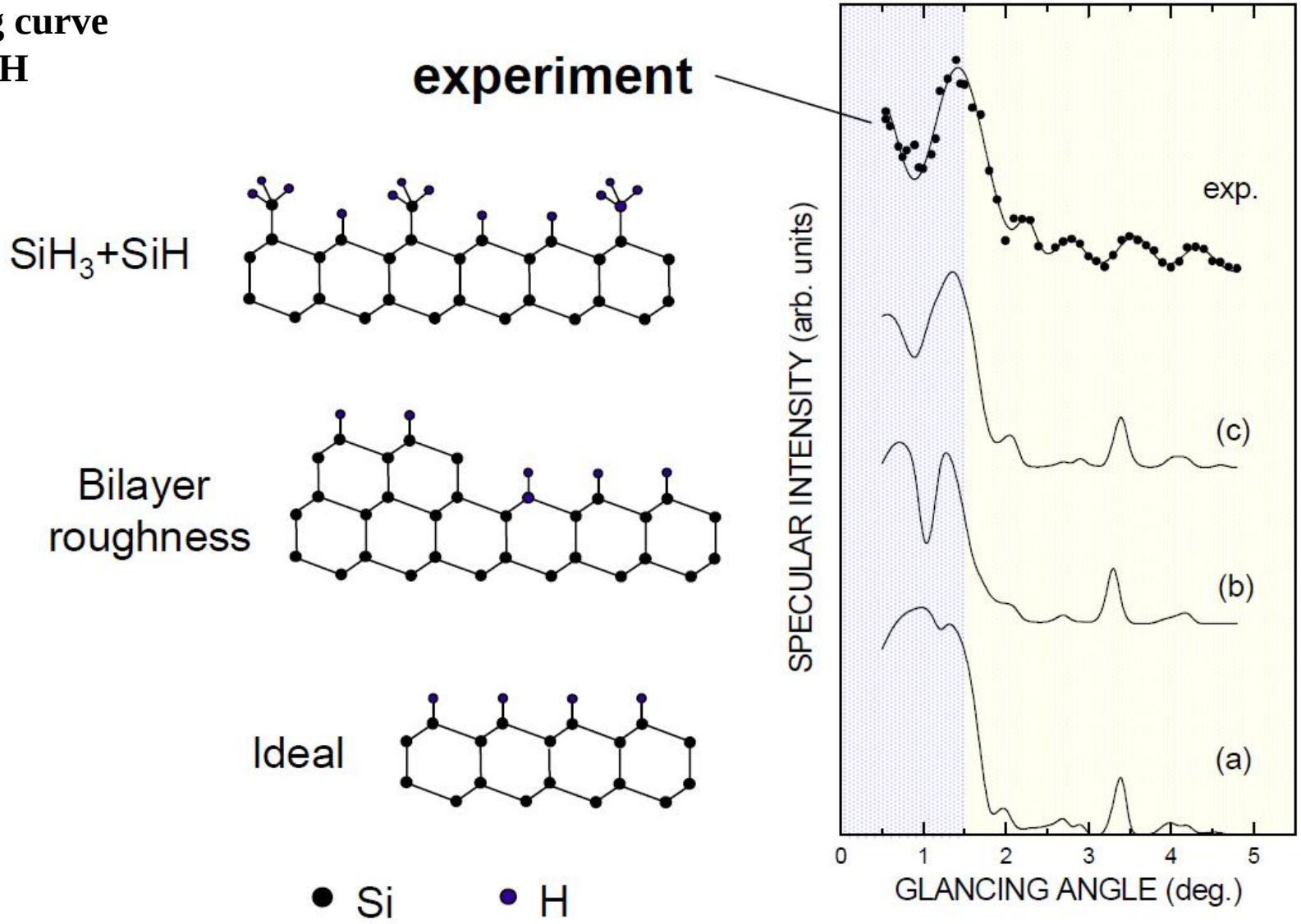
RHEPD = Reflection High-Energy Positron Diffraction

- **Rocking curve**
- **Si (111) H**



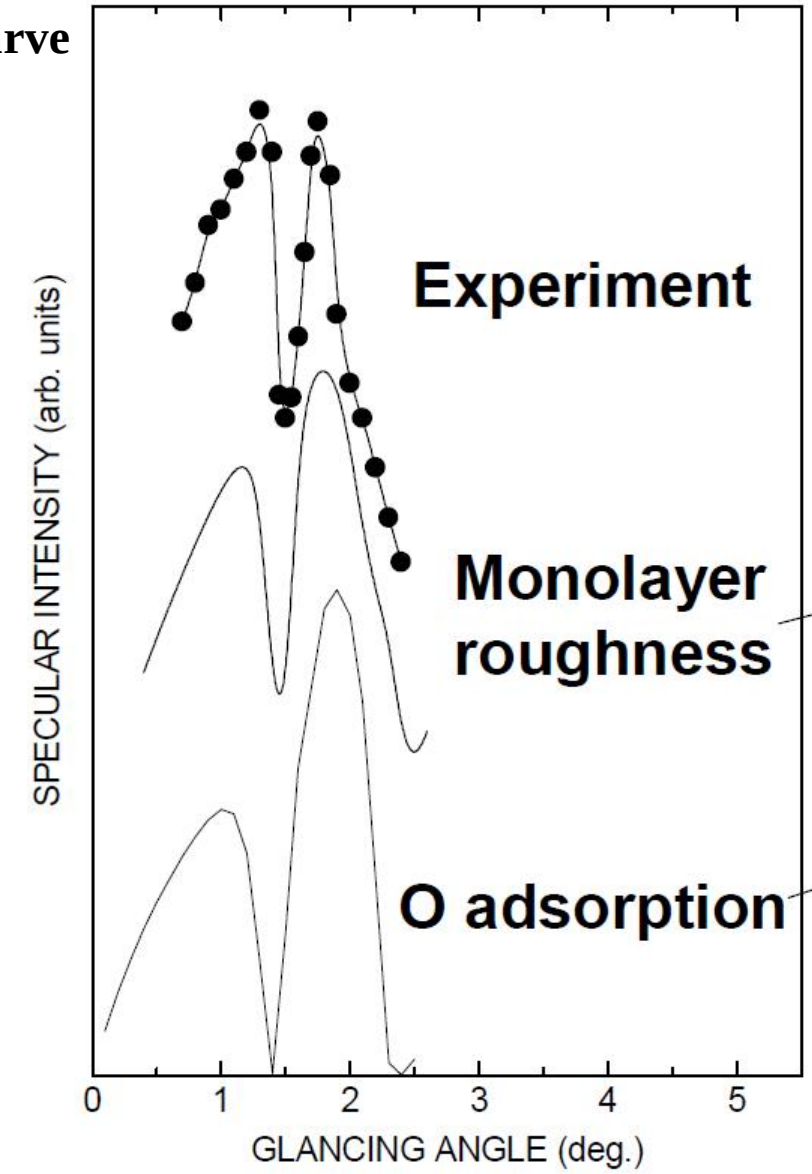
RHEPD = Reflection High-Energy Positron Diffraction

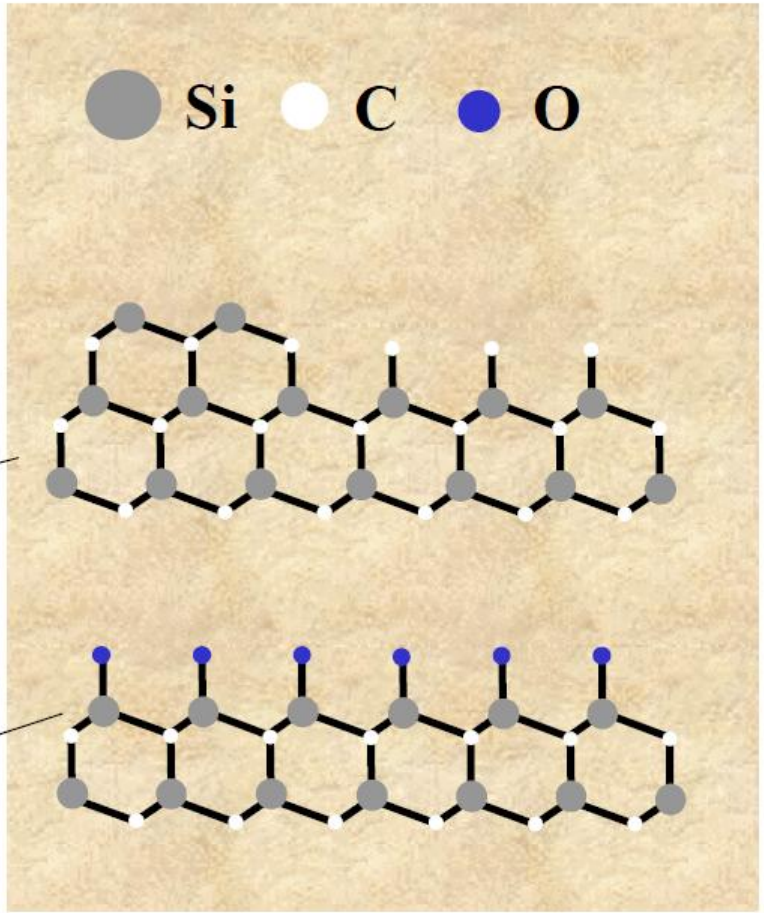
- **Rocking curve**
- **Si (111) H**



RHEPD = Reflection High-Energy Positron Diffraction

- **Rocking curve**
- **SiC (0001)**

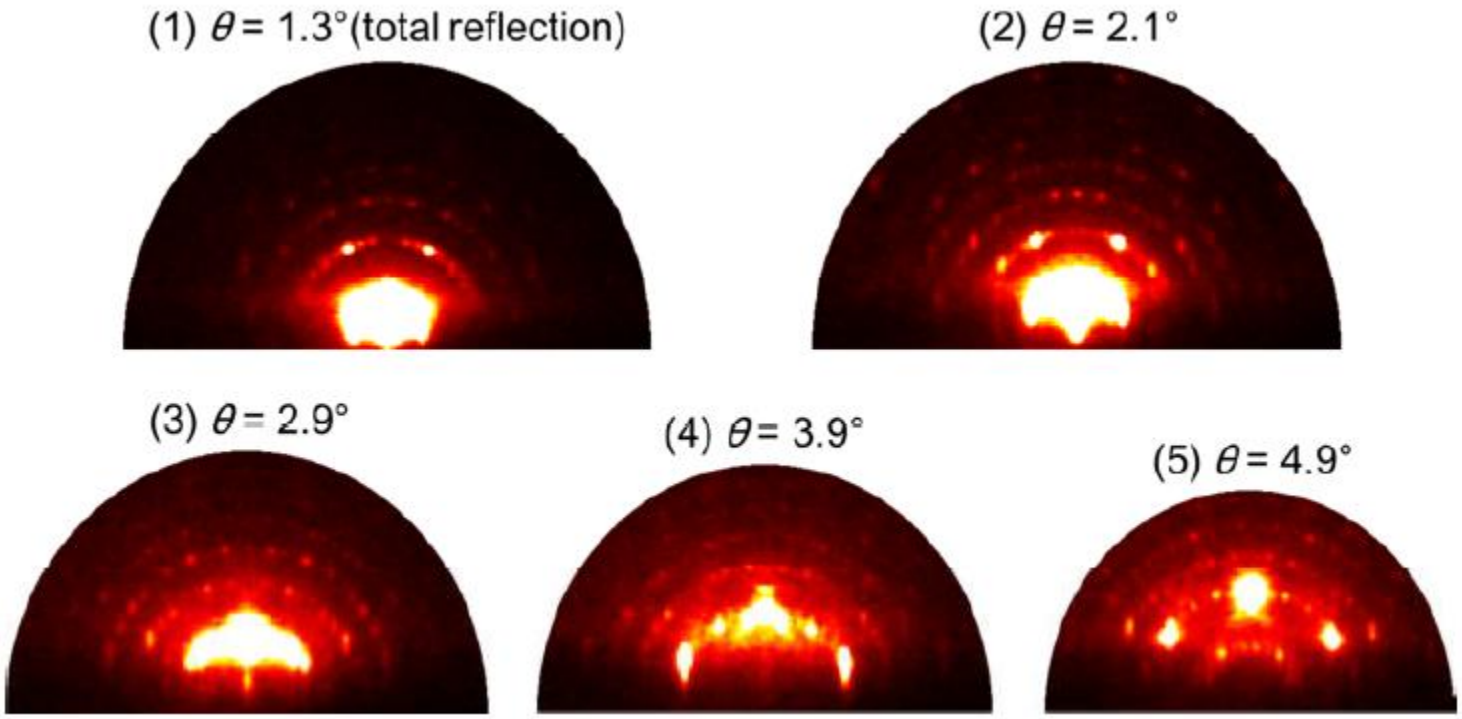




TRHEPD = Total Reflection High-Energy Positron Diffraction

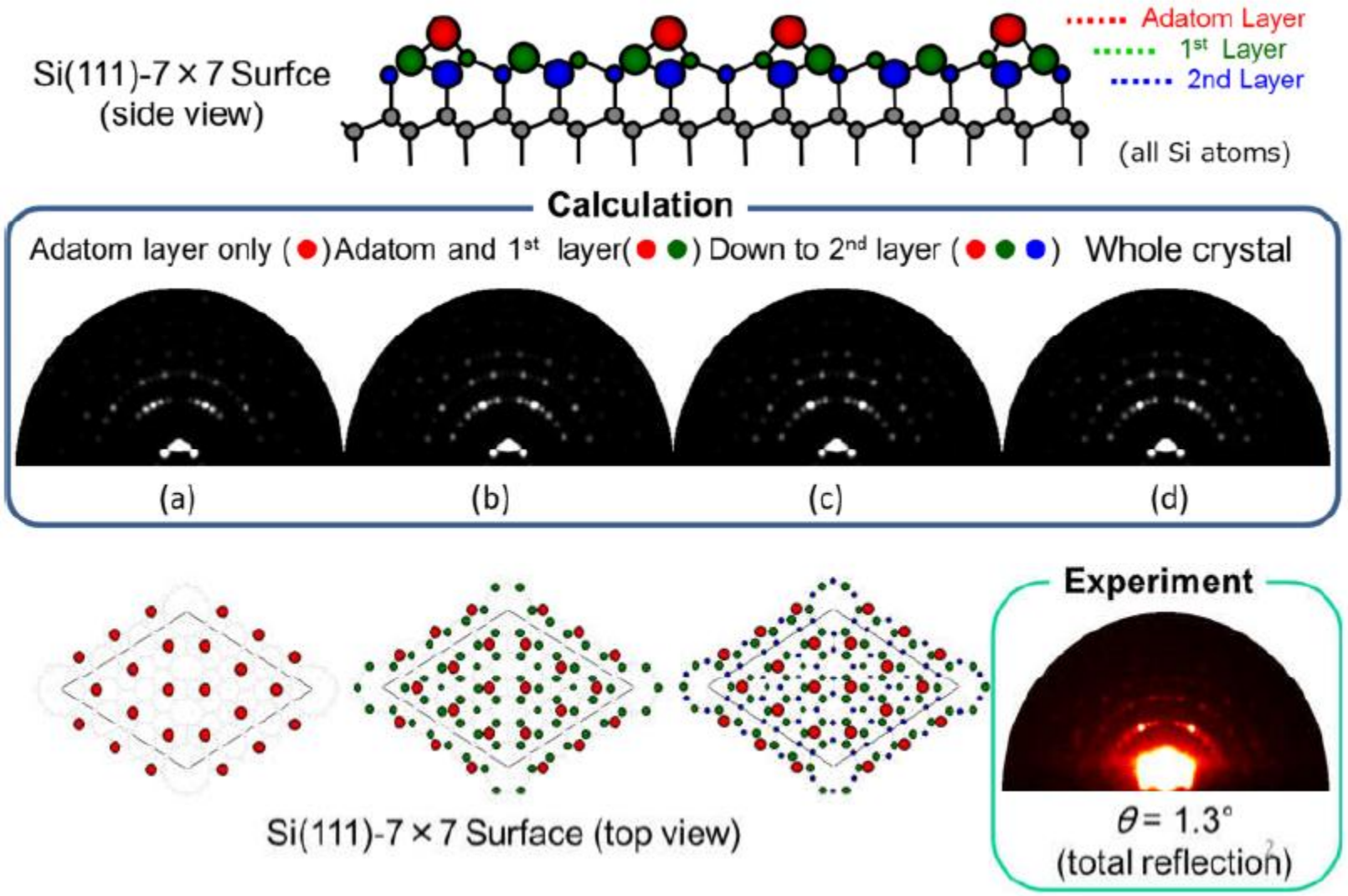
- **Si (111) 7 x 7 rekonstruovaný povrch**

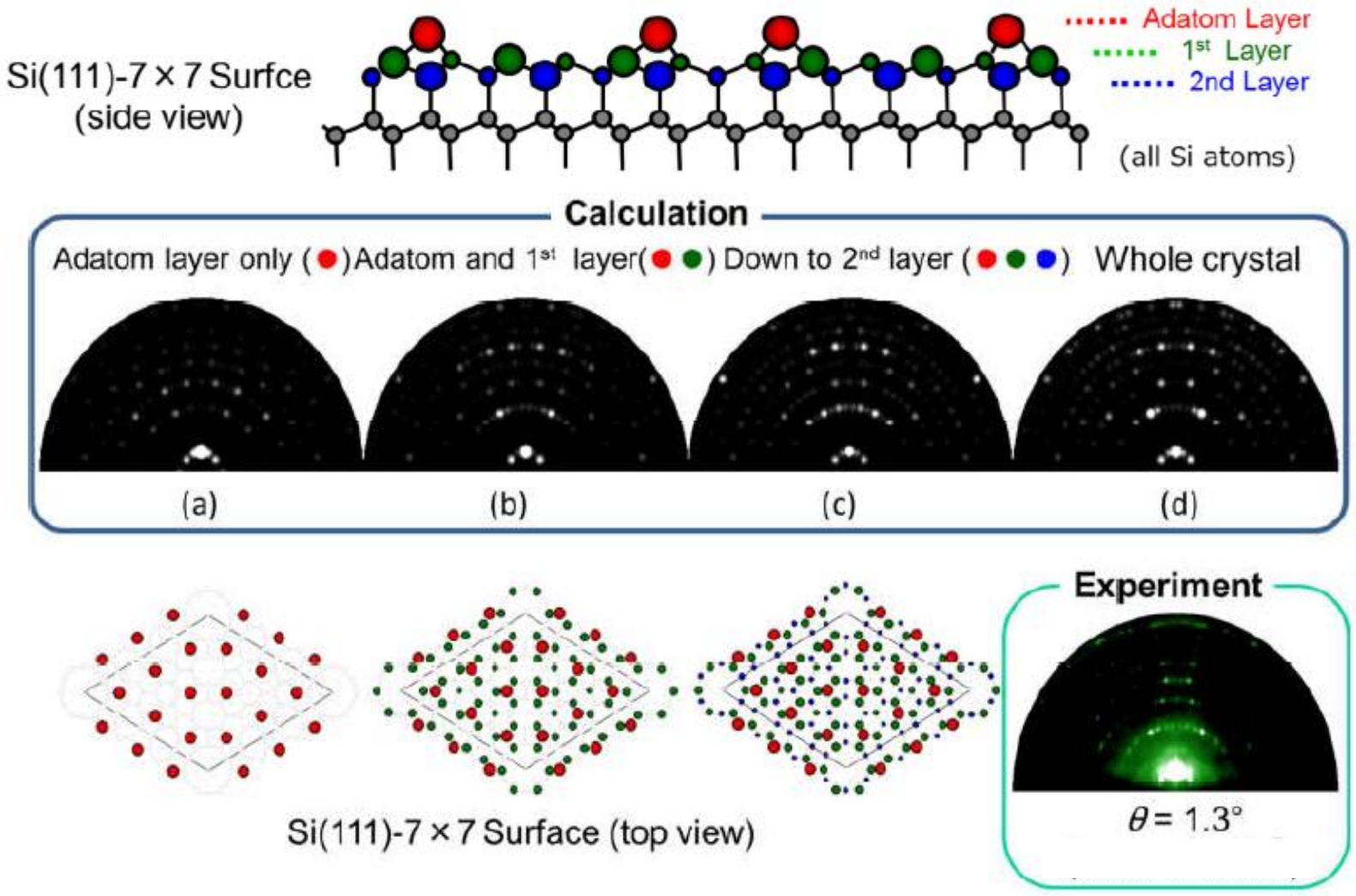
TRHEPD **RHEPD**



TRHEPD = Total Reflection High-Energy Positron Diffraction

- **Si (111) 7 x 7 rekonstruovaný povrch TRHEPD**



RHEED = Reflection High-Energy Electron Diffraction

- **Si (111) 7 x 7 rekonstruovaný povrch RHEED**