

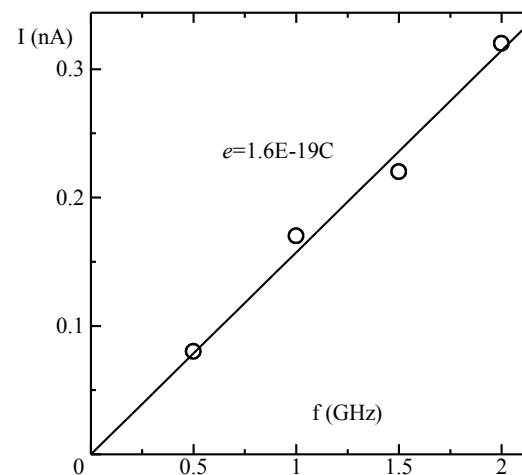
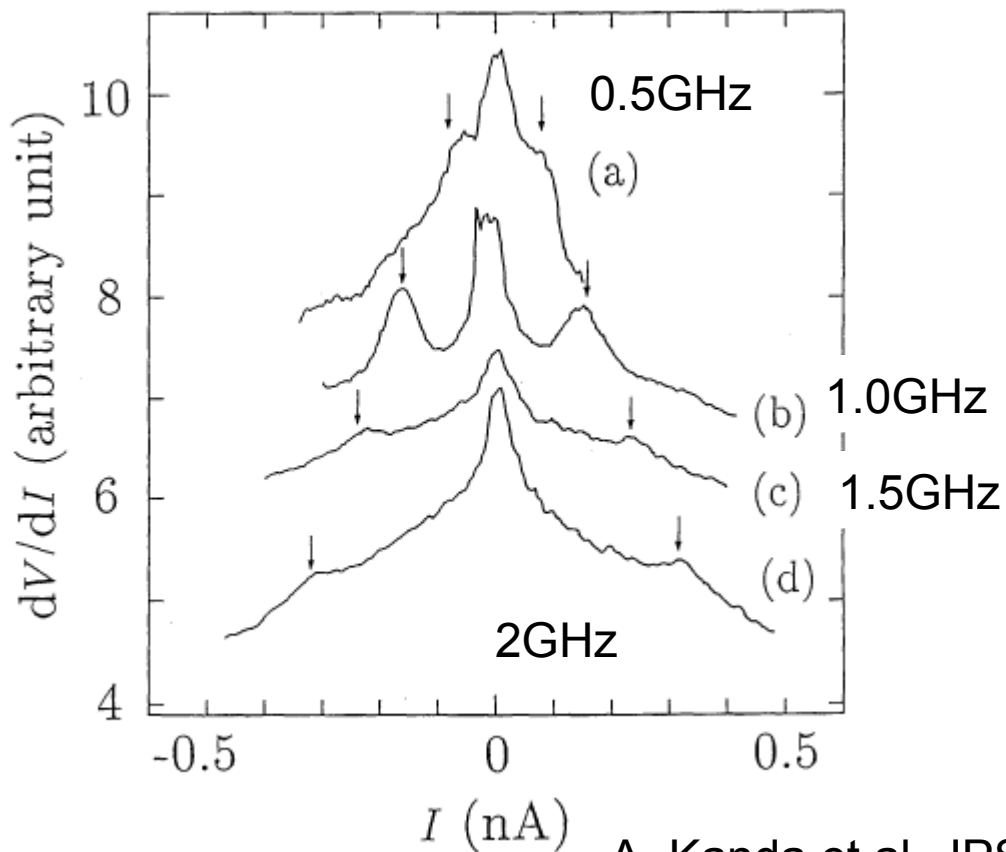
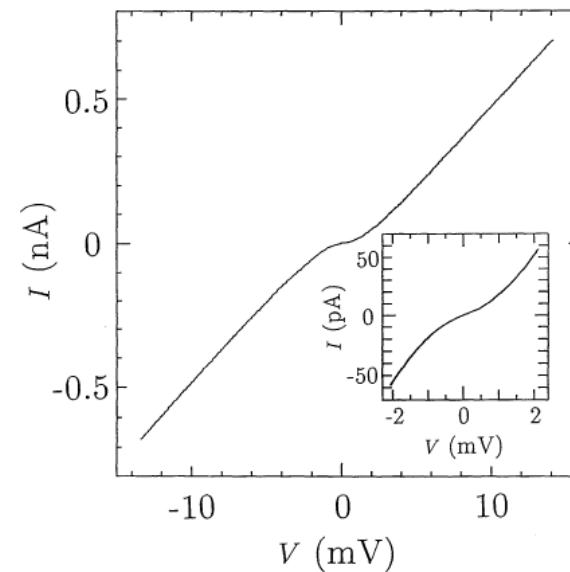
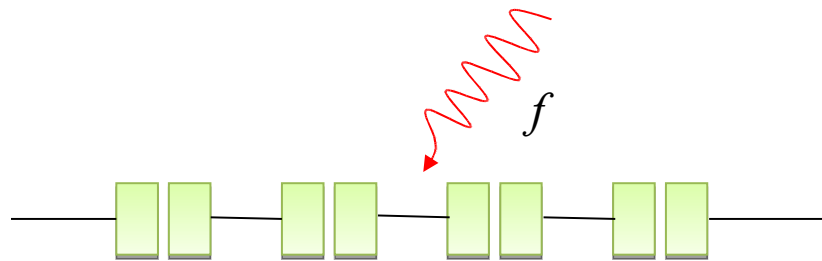
低温物理学

2009年5月14日

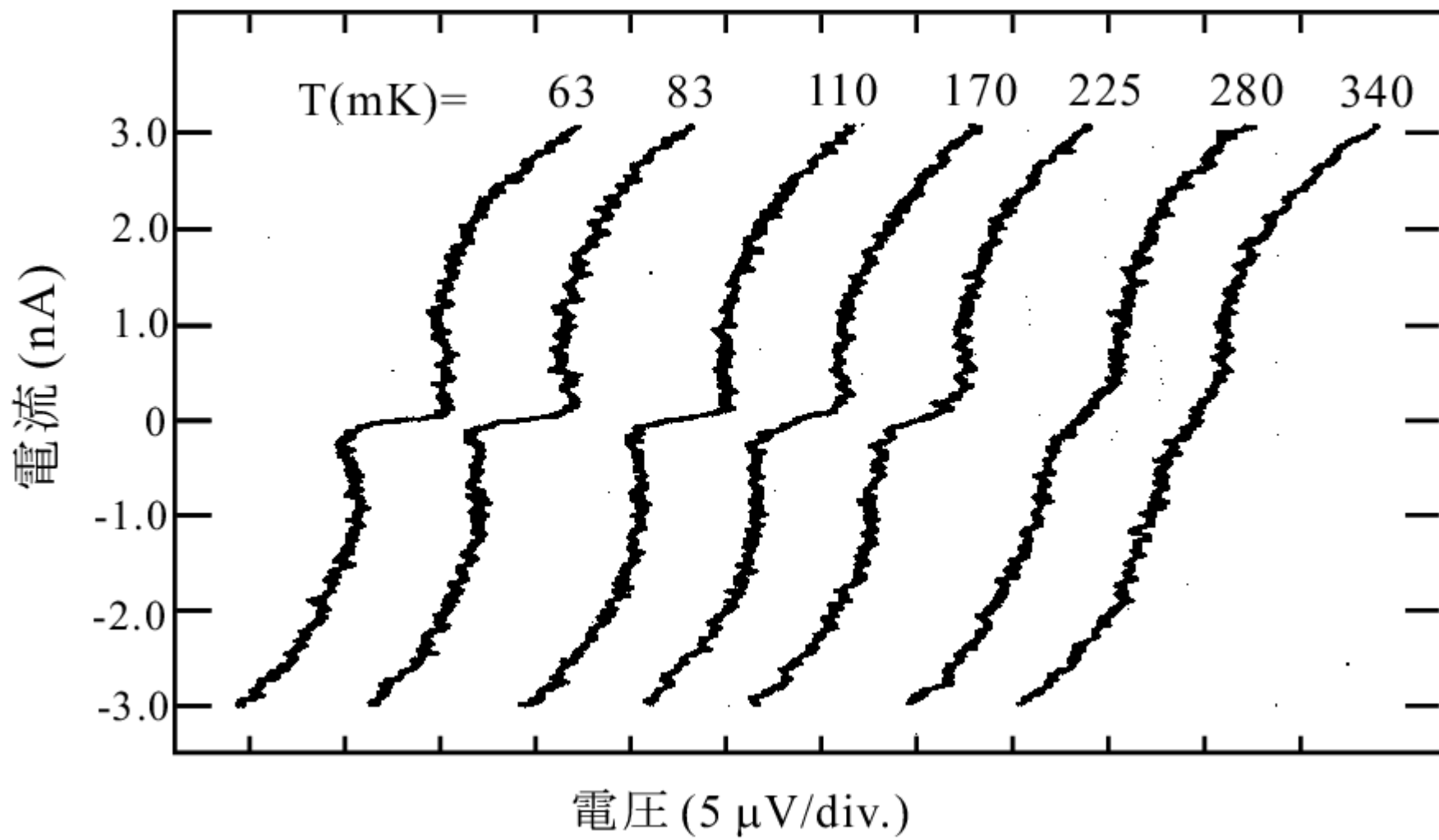
物性研究所

勝本信吾

単電子トンネル(SET)振動



Observation of Bloch Nose Structure

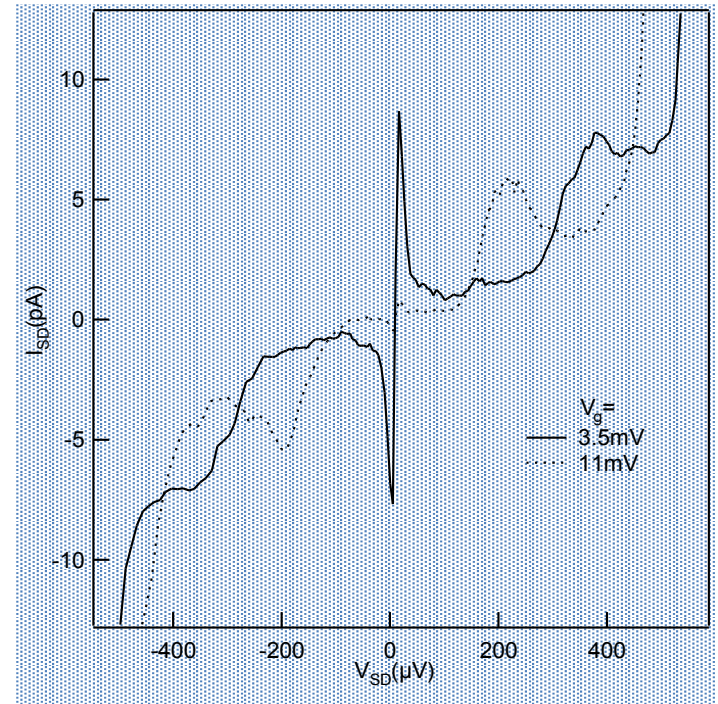
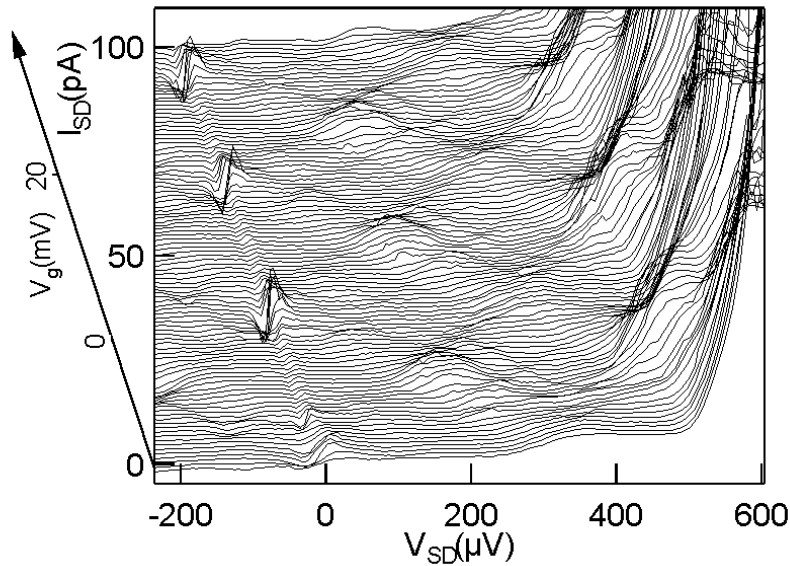




超伝導電流の制御

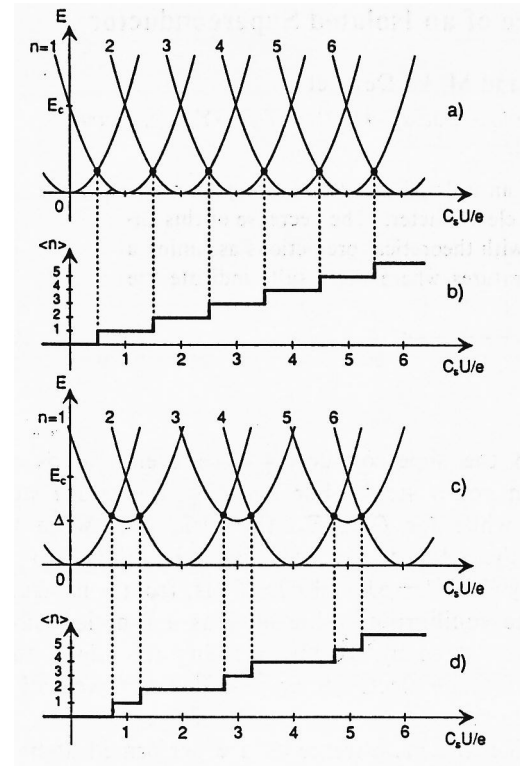
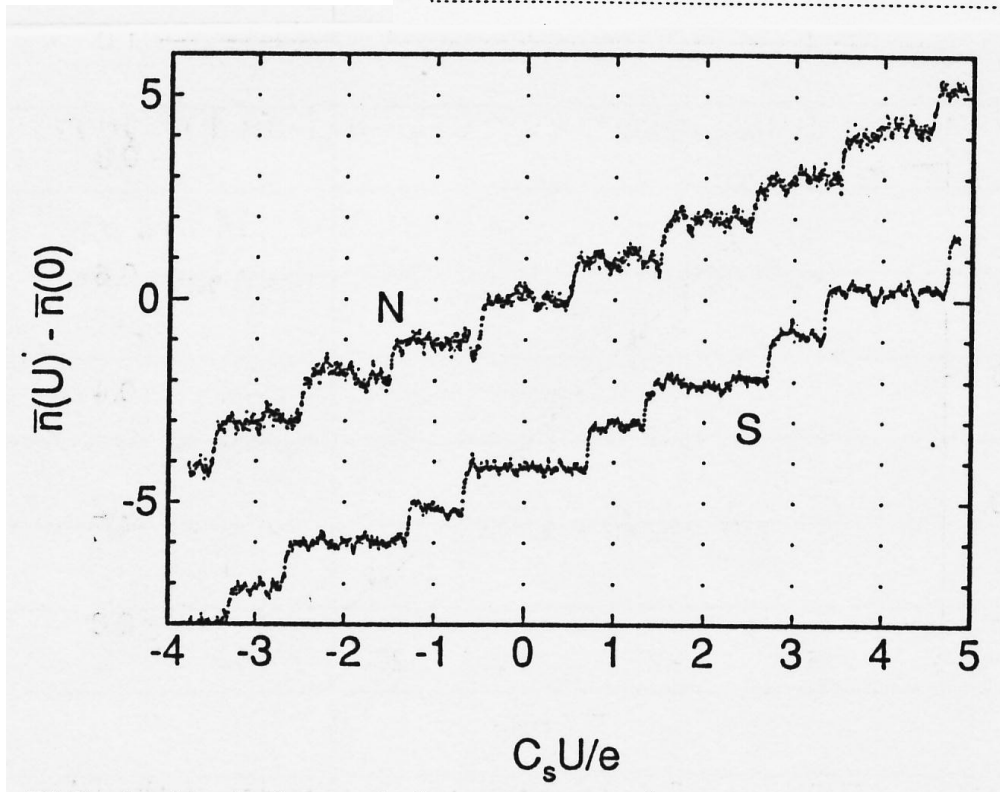
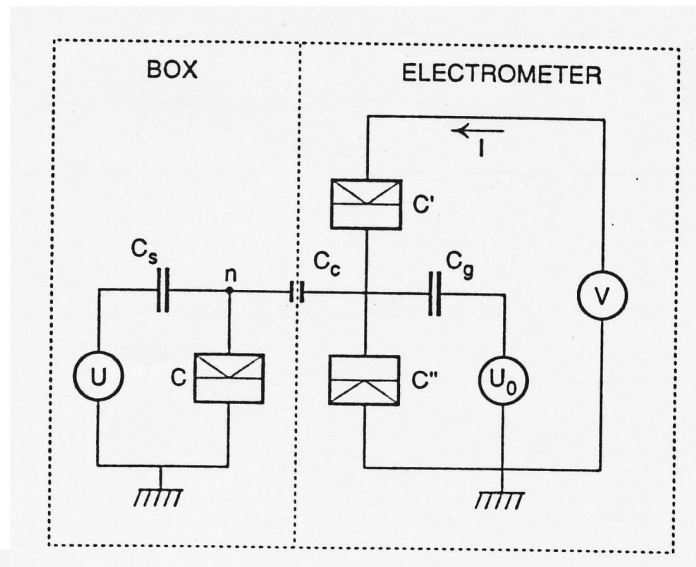
$$J_{\text{Max}} = \frac{2e}{\hbar} \frac{E_1 E_2}{2E_J} \sin \theta$$

$$J_{\text{Min}} = \frac{2e}{\hbar} \frac{E_1 E_2}{4E_C} \sin \theta$$



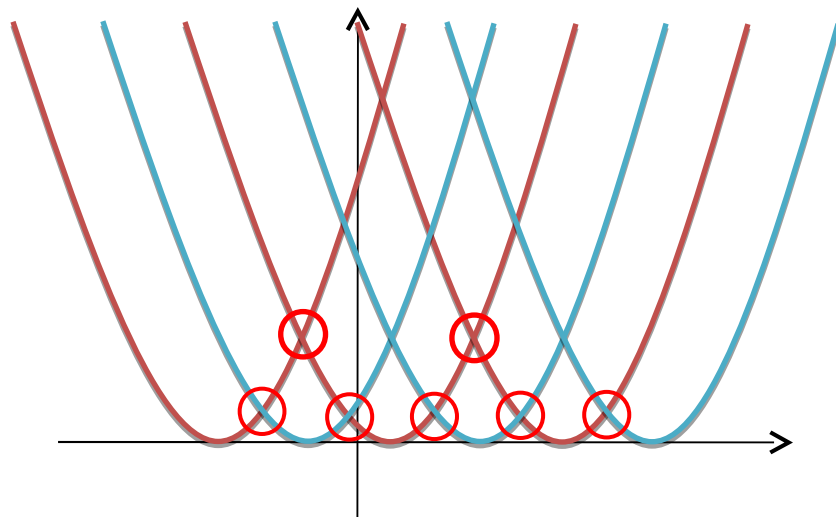
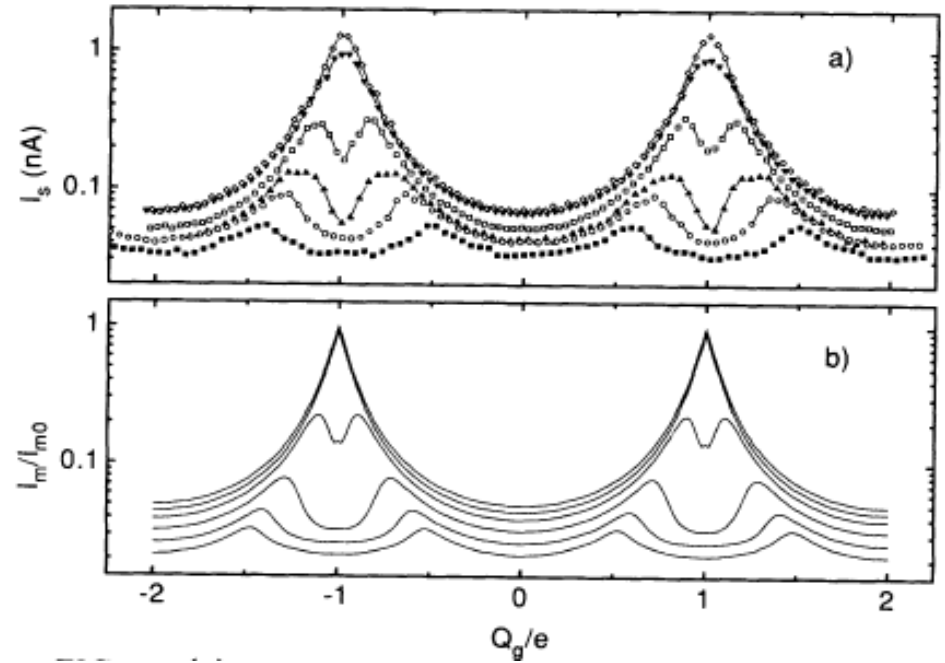
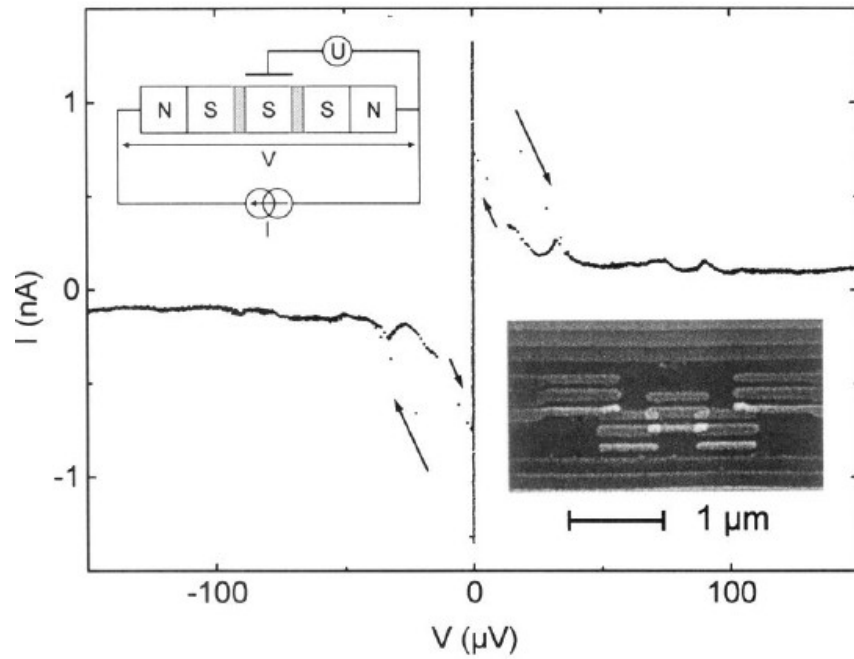


超伝導
Coulomb島



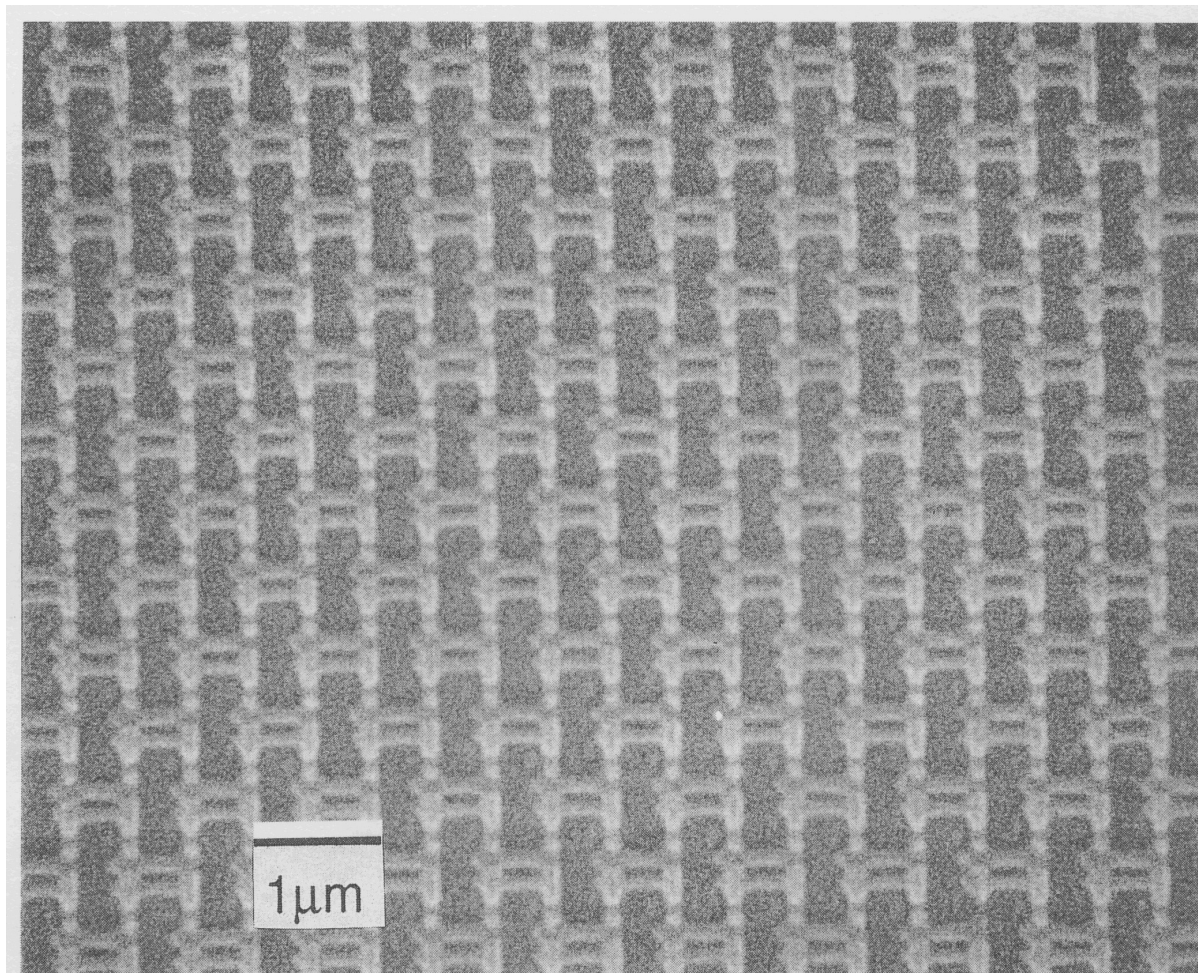
P. Lafarge et al.
Phys. Rev. Lett. **70**,
994 (1993).

Josephson Parity 効果

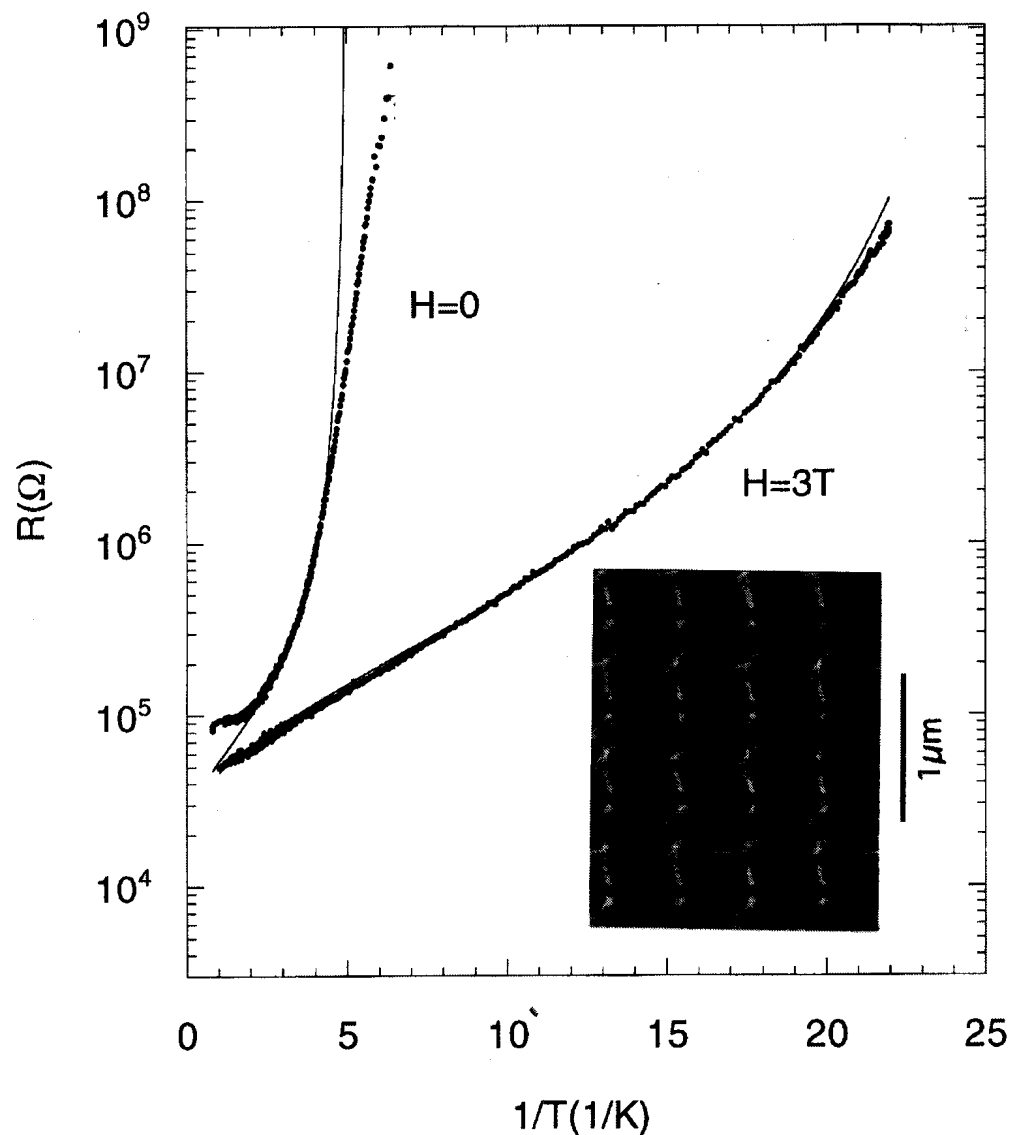


P. Joyez, PRL72, 2458 (1994)

電子線リソグラフィーで作製したAl微小接合列



電荷KTB転移に特徴的な電気抵抗の温度変化



$$R(T) \propto \exp\left(\frac{2b}{\sqrt{T/T_c - 1}}\right)$$

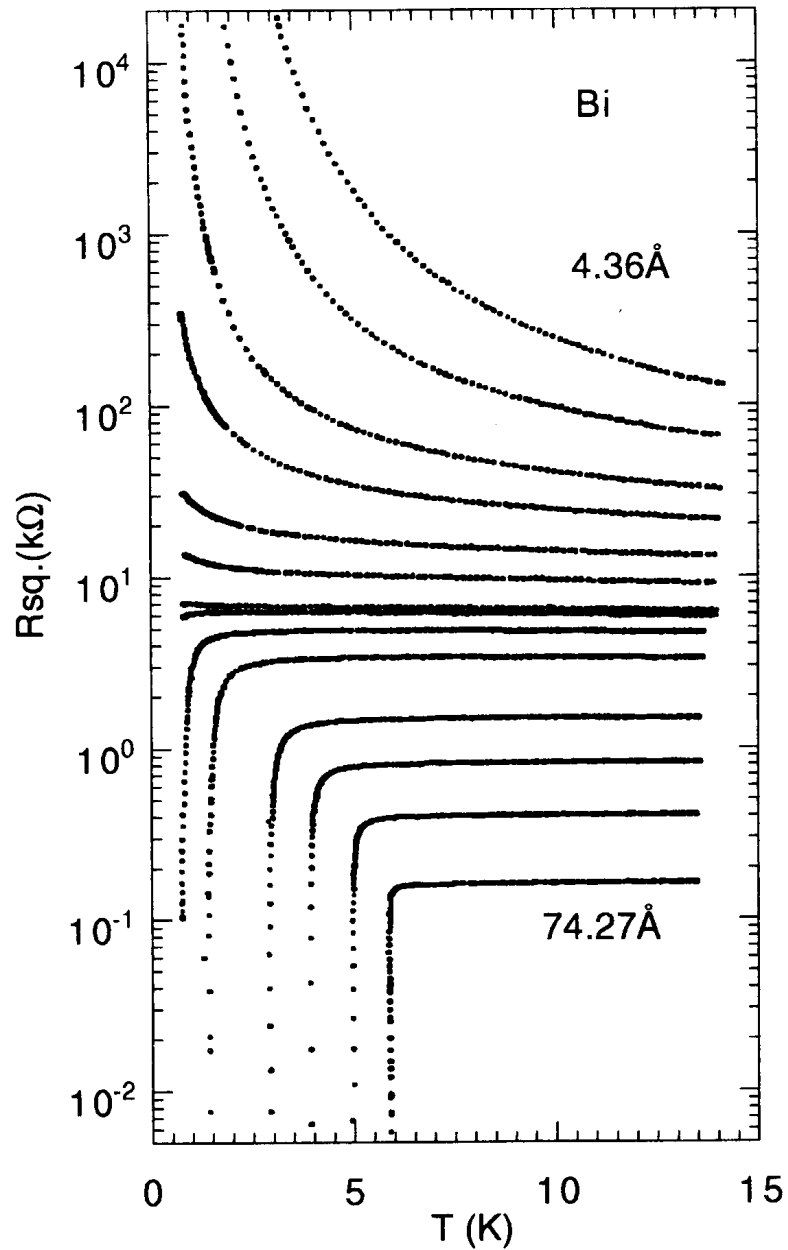


Fig. 20. Evolution of the temperature dependence of the sheet resistance with thickness for a Bi QCF deposited on a Ge buffer layer. From Ref. 63.

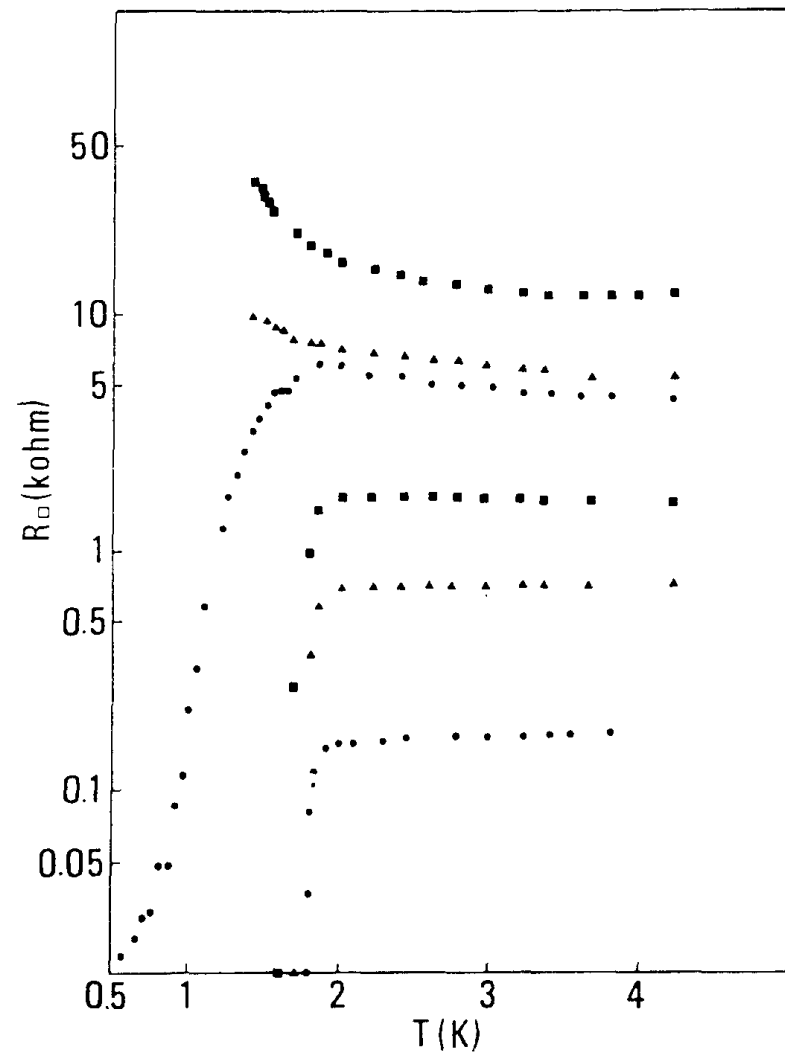
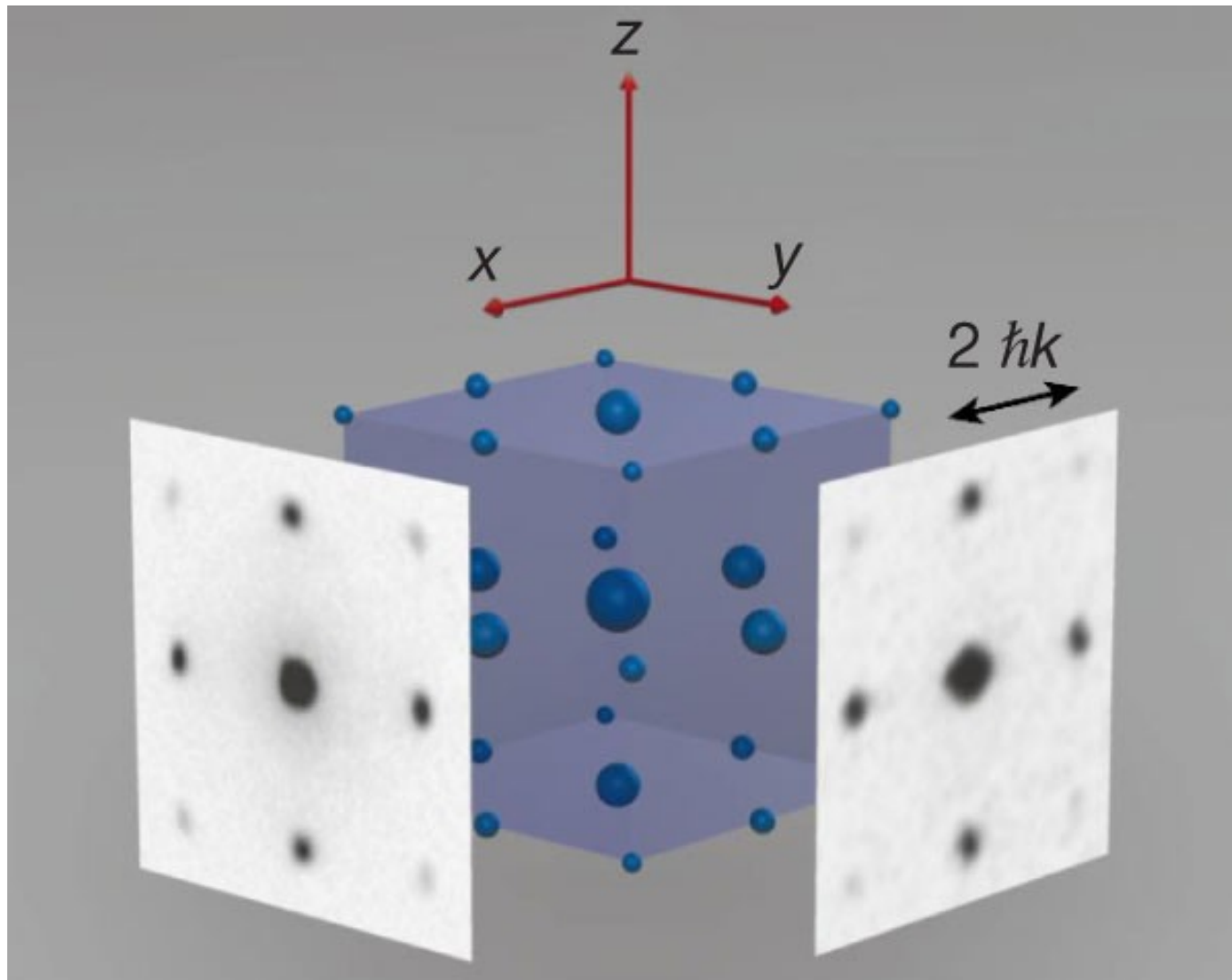


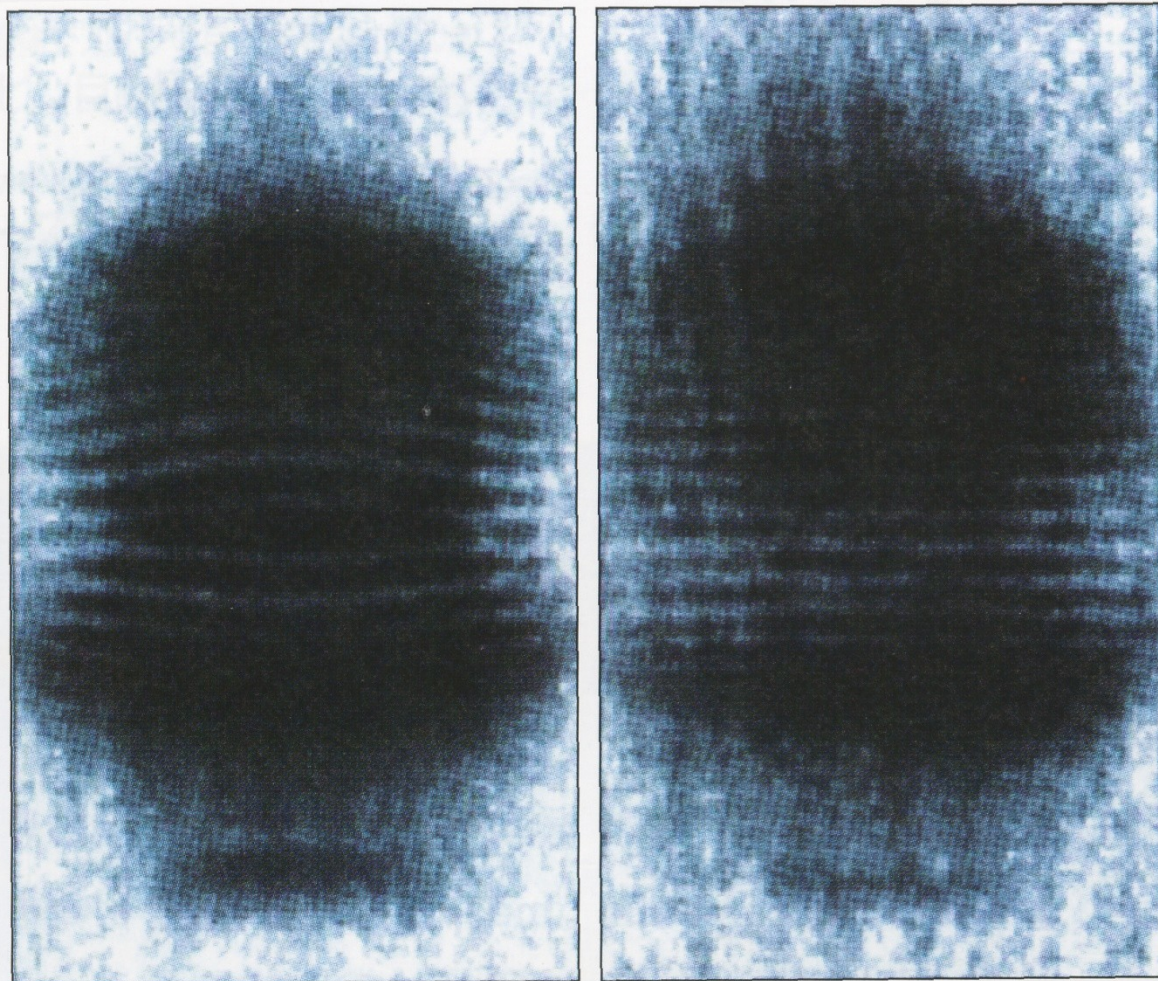
Fig. 23. Temperature dependence of sheet resistance for six different samples of Al FOMP's with average granule size of 15 Å. From Ref. 141.

光で作った「結晶格子」に対する原子波の回折



M. Greiner et al. Nature 415, 39 (2002)

原子レーザーによる干渉パターン



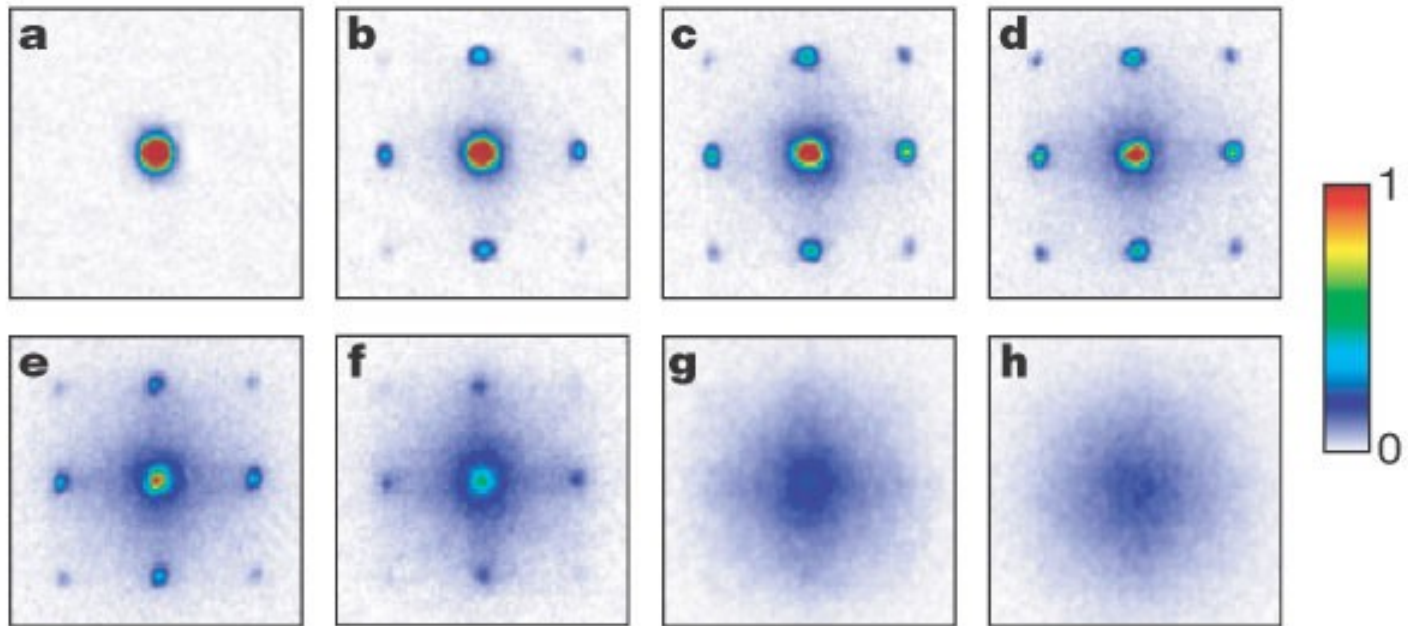
0

0.5

1

Absorption

ポテンシャル強度変化による回折パターンの変化



縦型量子ドット：調和ポテンシャル原子

