Surface-interface inclinations induce changes of effective masses

D.-R. Su (蘇德潤)
Physics Department, National Taiwan University, Tai-Pei

1. Reports from Ref. [1,2] provide us an 2-degrees inclination of some surfaces from regular crystal surfaces and an 0.5-degree mis-orientation of semiconductor surfaces.
2. From some new theories we can construct some inclination-structures as some new structures if we can setup.
3. In this report we have found from LEED and theories of MD of surface electrons, surface-electrons are insensitive or totally un-measurable for few degrees of inclinations.
4. My previous paper [3] provided that routine mathematical surfaces (e.g. z=0) are transformed by coordinate transformations. It was shown that material surface is not a mathematical surface in nature. When kinetic energy is write in form of tensors referred to the already-existed surface plane, we need to make transformations to its principal values by diagonalization. The transformation of this kind makes material surfaces non-mathematical, as claimed above. The transformation elements are effective masses-related essentially [4]. In the other way of treatments, the effective masses changes are induced by the transformation of this kind. Particularly for the cases of transformations of inclinations of surfaces.
5. For the inclined surface or interfaces, we find the hole-numbers are changed. But they are changed differently for Schottky barrier metal-semiconductor interfaces with respect to usual semiconductor-semiconductor heterostructures.

References: