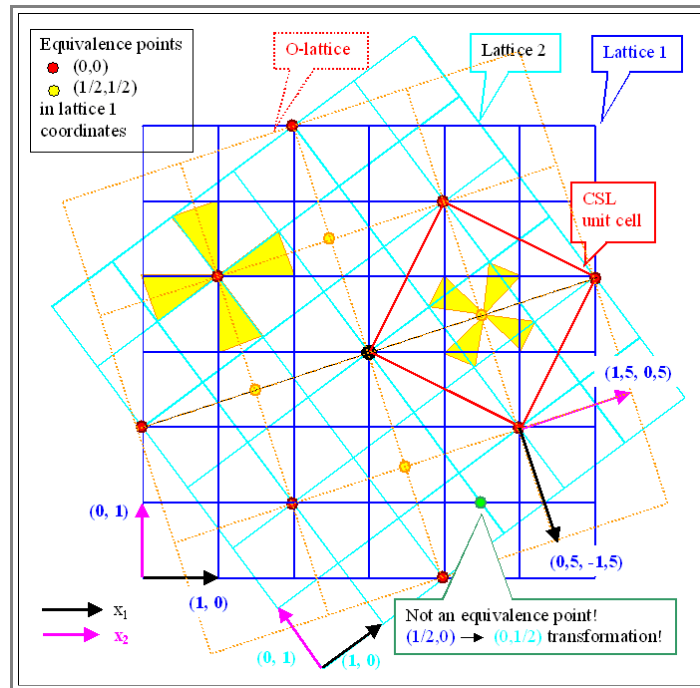


$\Sigma = 5$ CSL and O-Lattice

Illustration

Here is a large scale illustration of a $\Sigma = 5$ relationship in the O-lattice.

- There are more O-lattice points than lattice coincidence points - we have one extra equivalence point (equivalence coordinates $(1/2, 1/2)$ in addition to the O-point with equivalence coordinates $(0, 0)$).
- The lattice constant (and therefore the unit vectors) of the O-lattice are smaller by a factor of $2^{1/2}$.



In just looking at the picture, it is tempting to identify more O-points, the green point, e.g., looks very much like an O-point. Well, *it is not*, because:

- The green point, while marking middle positions on both lattices, is *not* an O-point, because its internal coordinates are $(1/2, 0)$ in lattice 1 and $(0, 1/2)$ in lattice 2. And while, yes, this marks a point midway between to lattice points in both lattices, it is still *not* an equivalence point!

The picture contains a new, very important feature:

- The yellow triangles denote **pattern elements**. While they indicate the rotation, they may simply be taken as *symbols representing the specific arrangement of atoms at specific equivalence points*. Equal symbols indicate equal arrangements, and identical equivalence points have identical pattern elements.
- The unit vectors of the three lattices are also shown; this will be important in some future context.