commensurate–incommensurate transition

Also contains definition of: lock-in state

A transition between two states having magnetic or crystallographic structures with a basic lattice and an imposed super-periodicity. In the commensurate (lock-in) state this super-periodicity is a simple rational multiple of the basic unit cell. In the incommensurate state the ratio of the super-periodicity repeat distance to the basic lattice repeat distance is irrational and may show continuous variation with variation in some degree of freedom (e.g. temperature, pressure, composition) of the system. Example: The transition of Rb_2ZnCl_4 from an incommensurate structure to a commensurate structure at the lock-in temperature, T_L, which is dependent on the crystal growth method and varies in the range 128 K to 190 K.
Note:
A commensurate–incommensurate transition also occurs in liquid-crystal systems where there is an incommensurability in the packing of dimers in relation to monomers.

Source:

PAC, 1994, *66*, 577 *(Definitions of terms relating to phase transitions of the solid state (IUPAC Recommendations 1994))* on page 579