A Delone $(r,R)$-set $X \subset \mathbb{R}^d$ is called regular if its symmetry group is transitive. Regular sets serve model of crystal. L.Pauling, R.Feynmann believed that long-range order in crystal comes out identity of patterns of nearby atoms. In 1970’s Delone initiated a problem to find link between local identity and global order, Dolbilin and Stogrin developed basics of local theory of crystals.

Given $(r,R)$-set $X, \rho > 0$, $\rho$-cluster at point $x \in X$ is called set $X_x(\rho)$ of points $x' \in X$ s.t. $|xx'| \leq \rho$. Let $S_x(\rho)$ denote a group of $X_x(\rho)$ and $N_x(\rho)$ the number of classes of $\rho$-clusters in $X$.

We will discuss the following statements:

I. $X$ is regular iff for some $\rho$ s.t. two conditions hold:
   (1) $N(\rho + 2R) = 1$; (2) $S_x(\rho) = S_x(\rho + 2R)$.

II. For $\forall \varepsilon > 0$ $\exists$ set $X$ s.t. $N(4R - \varepsilon) = 1$ but $X$ is not regular.

III. If $N(2R) = 1$ and $X_x(2R)$ is centrally symmetrical about $x$ then the $X$ is centrally symmetrical about $x$.

IV. If $X \subset \mathbb{R}^3$, $N(10R) = 1$ then $X$ is regular. (Received January 27, 2014)