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タイトル TITLE	Doubly laced crystals: axioms and structure		
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A crystal graph of  $U_q(g)$  is an edge-colored directed graph in which each connected monochromatic subgraph is a finite path and there are certain interrelations on the lengths of such paths, described in terms of a Cartan matrix  $M$  of  $g$ . An important class of crystals is formed by the crystals of representations, or *regular* crystals.

Stembridge (2003) pointed out a list of “local” graph-theoretic axioms characterizing the regular *simply laced* crystals.

In the talk we deal with the problem of “local” axiomatization of regular double laced crystals. There are three groups of results that we present. First, we give an explicit combinatorial construction for a class of 2-edge-colored graphs, which we call *S-graphs*. Second, we characterize the S-graphs by “local” axioms. Third, we develop a combinatorial *worm model* and show that the objects (*worm-graphs*) generated by this model are isomorphic to S-graphs. Moreover, we prove that the finite worm-graphs satisfy the conditions in Littelmann’s path model for regular  $B_2$ -crystals. As a result, we obtain that the set of finite S-graphs is just the set of regular  $B_2$ -crystals, and that these crystals are characterized by our “local” axioms. We also obtain new axiomatization of  $A_2$ -crystals.

Thus, we obtain an axiomatization of doubly laced crystals, since due to Kang et al., a crystal of type  $M$  is regular if and only if each (maximal connected) 2-colored subgraph in it is regular (concerning the corresponding  $2 \times 2$  submatrix of  $M$ ).