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Steven V Sam* (ssam@math.mit.edu) and **Peter Tingley**. *Torus actions, multi-partitions, and crystals.*

The Misra-Miwa model gives a $\widehat{\mathfrak{sl}}_n$ -crystal graph structure on the set of all partitions, and each connected component models the basic representation. Recently, Fayers gave a “deformation” of this crystal structure, one for each irrational number in a certain interval. His definition is combinatorial and uses Stembridge’s local characterization of crystals. On the other hand, Saito showed how to get crystal structures from Nakajima’s quiver varieties. We give a method of extracting a combinatorial model from Saito’s construction which depends on a choice of torus action, and show that the resulting combinatorics give Fayers’ crystals. This gives an algebraic definition of Fayers’ operators, as well as a more conceptual proof that his construction is correct. It also readily generalizes to give families of crystals for all highest weight representations of $\widehat{\mathfrak{sl}}_n$, which we describe combinatorially using multi-partitions. (Received August 21, 2011)