1070-05-158   **Cristian Lenart*** (`lenart@albany.edu`), Department of Mathematics, State University of New York at Albany, 1400 Washington Avenue, Albany, NY 12222, and **Anne Schilling** (`anne@math.ucdavis.edu`), Department of Mathematics, University of California, One Shields Avenue, Davis, CA 95616. *The energy function on crystals via the alcove model.* Preliminary report.

Crystals are colored directed graphs encoding quantum group representations when the quantum parameter goes to 0. Crystals for affine Kac-Moody algebras are endowed with a grading given by the energy function, which also appears in the theory of exactly solvable lattice models. In Lie type A, Lascoux and Schützenberger defined a statistic called charge (on the corresponding crystals), which is easier to compute. Nakayashiki and Yamada showed that the charge coincides with the energy; their proof is based on intricate combinatorics of Young tableaux. We will present a transparent approach to this problem, which is based on the alcove model in the representation theory of Lie algebras, and is also connected to the theory of Macdonald polynomials. Then we will discuss the generalization to other classical types, in particular the construction of a type C charge. Part of this work is joint with Anne Schilling. (Received February 08, 2011)