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**Jesus A. De Loera\*** (deloera@math.ucdavis.edu), Dept. of Mathematics, Univ. of California, Davis, CA 95616. *Integral versions of Helly's theorem and Applications.*

The famous Doignon-Bell-Scarf theorem is a Helly-type result about the existence of integer solutions on systems linear inequalities. The purpose of this paper is to present the following “weighted” generalization: Given an integer  $k$ , we prove that there exists a constant  $c(k, n)$ , depending only on the dimension  $n$  and  $k$ , such that if a polyhedron  $x : Ax = b$  contains exactly  $k$  integer solutions, then there exists a subset of the rows of cardinality no more than  $c(k, n)$ , defining a polyhedron that contains exactly the same  $k$  integer solutions. We work on both upper and lower bounds for this constant. All new results joint work with I. Aliev, Q. Louveaux, R. Bassett (Received August 05, 2014)