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**Alvaro Pelayo\*** (apelayo@umich.edu), 530 Church Street, 2074 East Hall, Mathematics Department, University of Michigan, Ann Arbor, MI 48109. *Combinatorics of the toric symplectic ball packing problem and the topology of spaces of toric symplectic embeddings.*

We present two results:

(1) A solution to the toric version of the *symplectic ball packing problem*, in the sense of listing all symplectic–toric manifolds which admit a perfect packing by balls embedded in a symplectic and torus equivariant fashion. This is an equivariant version of the classical symplectic ball packing problem, on which a lot of progress has been done for 4-dimensional manifolds by McDuff, Biran and Lalonde–Pinsonnault among others. The techniques used by these authors ( $J$ -holomorphic curves) are unique to dimension 4.

(2) An explicit formula to compute the *homotopy type of the space of toric symplectic embeddings* from a ball into a symplectic–toric manifold. The formula is in terms of the rational lengths of the edges of the convex polytope associated (by the Atiyah–Guillemin–Sternberg theorem) to the aforementioned symplectic manifold.

Both results hold for manifolds of arbitrary dimension. (Received September 05, 2006)