1003-14-1252   **Yuji Kodama*** (`kodama@math.ohio-state.edu`), Department of Mathematics, Ohio State University, 231 West 18th Avenue, Columbus, OH 43210. *Zeros of Schur polynomials and cohomology of certain compact Lie groups.* Preliminary report.

We describe a connection between

(a) the singularities (blow-ups) of the Kostant-Toda lattice associated with a real split semisimple Lie algebra $\mathfrak{g}$,

(b) the cohomology of a compact Lie group K of G with $\mathfrak{g} = \mathrm{Lie}(G)$,

(c) the number of points of a Chevalley group $K(\mathbb{F}_q)$ related to the group K over the finite field $\mathbb{F}_q$.

In particular, the blow-ups of the Toda lattice are given by the zeros of the Schur polynomials associated with rectangular Young diagrams. Those Schur polynomials are the τ-functions for the nilpotent Toda lattices. This work is a joint work with Luis Casian. (Received October 04, 2004)