1003-58-1040 **Carolyn S. Gordon**, **Eran Makover** and **David L. Webb*** (David.L.Webb@Dartmouth.edu), Department of Mathematics, Dartmouth College, Hanover, NH 03755. *Jacobians of Sunada isospectral Riemann surfaces.* Preliminary report.

We study the Jacobians of compact Riemann surfaces that are isospectral because of Sunada's construction. In the algebraic setting of Sunada's theorem, we use "transplantation" of group invariants and group coinvariants to give a geometric proof of a result of Prasad and Rajan, that Sunada isospectral Riemann surfaces have isogenous Jacobians. We also consider the Jacobians of Sunada isospectral Riemann surfaces as principally polarized abelian varieties; we show that, when this extra structure is taken into account, a weaker relation among the Jacobians holds. Roughly, if the Jacobians had a common finite cover taking the polarizations into account, then they would lie in the same orbit of a certain action of the rational symplectic group; we show instead that they lie in the same orbit of an action of the symplectic group with coefficients in a finite extension of the rational field. Finally, we show that Sunada isospectral compact Riemannian manifolds have isomorphic real cohomology algebras. (Received October 03, 2004)