1035-22-1409 **Nolan R Wallach*** (nwallach@ucsd.edu), Department of Mathematics, University of California, San Diego, La Jolla, CA 92093. *Some invariant theoretic computations related to quantum computing.* Preliminary report.

Let $V = \otimes^n \mathbb{C}^2$ as a real vector space and let the n-fold product of $SU(2)$, K, act on V via the complex tensor product action thought of as real. Let $\mathcal{O}_{\mathbb{R}}(V)$ be the algebra of complex valued polynomials on the real vector space V. Finally set $\mathcal{O}_{\mathbb{R}}(V)^K$ equal to the algebra of K invariants in $\mathcal{O}_{\mathbb{R}}(V)$. The basic problem is:

Find a set of generators for $\mathcal{O}_{\mathbb{R}}(V)^K$.

A slightly weaker problem is:

Find a system of parameters for $\mathcal{O}_{\mathbb{R}}(V)^K$.

The latter problem is a major step in the solution of the first. Although these problems involve relatively easy looking groups for relatively small values of n one reaches the "combinatorial explosion". We will discuss recent successes and failures in studying these problems. (Received September 19, 2007)