1135-57-1837 **Liang Chang** and **Shawn X Cui*** (cuixsh@gmail.com), 382 Via Pueblo Mall, Varian Laboratory of Physics, Stanford, CA 94305. *On Two Quantum Invariants of Three Manifolds from Hopf Algebras.*

We prove a conjecture relating two families of quantum invariants of 3-manifolds, namely the non-involutory Kuperberg invariant and the Hennings-Kauffman-Radford (HKR) invariant, both constructed from certain Hopf algebras. The former can be viewed as a non-semisimple generalization of the Turaev-Viro (TV) invariant and the latter a non-semisimple generalization of the Reshetikhin-Turaev-Witten (RTW) invariant. While in the semisimple case it is a classical result that the TV invariant is equal to the norm square of the RTW invariant, the relation in the non-semisimple case has remained a conjecture. We prove two versions of the conjecture. Let M be a closed oriented 3-manifold, $D(M)$ the double of M, H a finite dimensional Hopf algebra, and $D(H)$ the Drinfeld double of H. (I) If $Z(H)$ is ribbon, then the Kuperberg invariant of M endowed with a framing constructed from H is equal to the HKR invariant of M endowed with an appropriate 2-framing constructed from $D(H)$; (II) If H is ribbon, then the Kuperberg invariant of M endowed with a framing constructed from H is equal to the HKR invariant of $D(M)$ endowed with an appropriate 2-framing constructed from H. (Received September 25, 2017)