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Robert G Underwood* (runderwo@auburn.edu), Dept. of Mathematics and Computer Science, Auburn University at Montgomery, Montgomery, AL 36124. *Hopf Galois Structures and Binary Quadratic Forms*. Preliminary report.

Let L/\mathbb{Q} be a Galois extension with group D_3 . Then L/\mathbb{Q} admits a canonical non-classical Hopf Galois structure with Hopf algebra H_λ . By a theorem of C. Greither, $H_\lambda \cong \mathbb{Q}[D_3]$ as \mathbb{Q} -algebras. In this paper we show that up to scalar multiplication, nilpotent elements in H_λ correspond to rational points on a certain conic over \mathbb{Q} . Using this result we give a new proof of Greither's theorem. This is joint work with A. Koch, T. Kohl and P. J. Truman. (Received January 29, 2019)