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Alex Kasman* (kasmana@cofc.edu). *Producing and Understanding Quaternion-valued Solutions to the KdV Equation.*

Although both the KdV Equation and quaternions are already well-studied, I aim to convince you that this student research project generated some interesting and new results about their intersection. We utilize the unique properties of quaternions to develop new methods for producing and understanding the behavior of these non-commutative KdV solutions. The main theorem characterizing the non-linear super-position of breather solitons with other solutions gives what I believe are new results even in the real/commutative case. (Received September 06, 2019)