

## Playing with quaternions unit gain graphs

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A quaternion unit gain graph is a graph where a quaternion unit  $q$  is assigned to each oriented edge  $e_{ij}$ , and the conjugate  $\bar{q}$  is assigned to  $e_{ji}$ . In a non-commutative context there exists a “left” spectral theory and a “right” spectral theory. I will show how the latter, but not the former, encapsulates some classical spectral results holding for ordinary graphs, signed graphs and complex unit gain graphs. Bounds for both the left and right eigenvalues of the adjacency and Laplacian matrix are also given, together with some explicit computations.