1077-46-1856   **James A Mingo*** (`mingo@mast.queensu.ca`), Department of Mathematics and Statistics, Queen's University, Kingston, Ontario K7L 3N6, Canada, and **Octavio Arizmendi**. *Second Order Even and R-diagonal Operators.* Preliminary report.

Voiculescu showed that circular operators, the free analogue of complex Gaussian random variables, and Haar unitaries are related by polar decomposition. This relationship was deepened by Nica and Speicher who showed that both are examples of R-diagonal operators. Nica and Speicher also showed that R-diagonal operators and even operators, self-adjoint operators with vanishing odd moments, are related combinatorically and via their free cumulants. We extend these results to the case of second order freeness. (Received September 21, 2011)