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From Neumann to Steklov and beyond, via Robin: the Weinberger way

Weinberger showed the first nontrivial Neumann eigenvalue of the Laplacian is maximal for the ball, among domains of fixed volume. Brock did the same for the first nontrivial Steklov eigenvalue. We connect these two results by generalizing to the second Robin eigenvalue of the Laplacian. The Robin parameter here is negative, lying in the range between the Neumann and Steklov eigenvalues and going even somewhat beyond the Steklov regime.