

# Marc Dambrine

Université de Pau, France, and Universidad de Chile

## An extremal eigenvalue problem for the Wentzell–Laplace operator

### Abstract:

We consider the question of giving an upper bound for the first nontrivial eigenvalue of the Wentzell–Laplace operator of a domain  $\Omega$ , involving only geometrical informations. We provide such an upper bound, by generalizing Brock’s inequality concerning Steklov eigenvalues, and we conjecture that balls maximize the Wentzell eigenvalue, in a suitable class of domains, which would improve our bound. To support this conjecture, we prove that balls are critical domains for the Wentzell eigenvalue, in any dimension, and that they are local maximizers in dimension 2 and 3, using an order two sensitivity analysis. We also provide some numerical evidence.