Barcodes of Persistent Intersection Cohomology and the Witten Deformation on a Singular Space

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For smooth manifolds, Le Peutrec, Nier and Viterbo proved an Arrhenius law for the Witten Laplacian under weak assumptions on the potential; see [1].
In this talk, I will report on work in progress aimed at generalizing this result to singular spaces.
We will recall the definition of spaces with isolated conical singularities before discussing intersection homology in the sense of Goresky and MacPherson. In the singular case, the Witten Laplacian is not essentially self-adjoint. Therefore, I will speak about different closed extensions of the Witten Laplacian and their relation to intersection cohomology.
If the potential has a single critical value, the only exponentially small eigenvalue of the Witten Laplacian is zero. Time permitting, I will prove this fact for the singular case.

References

[1] D. Le Peutrec, F. Nier, and C. Viterbo. *Bar codes of persistent cohomology and Arrhenius law for p-forms*, volume 450 of *Astérisque*. Paris: Société Mathématique de France (SMF), 2024.