Conformal metrics on the four-dimensional upper hemisphere with symmetric Q and T curvatures

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We address the problem of prescribing non-constant Q and boundary T curvature on the upper hemisphere $\mathbb{S}^4_+ \subset \mathbb{R}^5$, via a conformal change of the background metric. This is equivalent to solve a fourth-order non-linear elliptic boundary value problem with a third-order non-linear equation and homogeneous Neumann conditions at the boundary. The problem admits a Mean-field type variational formulation, similar to the one obtained by Cruz-Blázquez and Ruiz in [1], with the associated energy functional being bounded from below but, in general, not coercive. By imposing symmetry conditions, we are able to prove the existence of minimizers, especially when $Q, T \geq 0$.

This is a joint work with Azahara DeLaTorre, from Sapienza University of Rome.

References

[1] S. Cruz-Blázquez and D. Ruiz, *Prescribing Gaussian and geodesic curvatures on disks*, *Advanced Nonlinear Studies* **18** (2018), 453-468.