Multiplicity results for the prescribed scalar curvature on low spheres

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Abstract. In this paper, we consider the problem of multiplicity of conformal metrics of prescribed scalar curvature on standard spheres $\mathbb{S}^3$, $\mathbb{S}^4$. Under generic conditions we establish some *Morse Inequalities at Infinity*, which give a lower bound on the number of solutions to the above problem in terms of the total contribution of its *critical points at Infinity* to the difference of topology between the level sets of the associated Euler-Lagrange functional. As a by-product of our arguments we derive a new existence result on $\mathbb{S}^4$ through an Euler-Hopf type formula.