SAMUEL ZEITLER, Carnegie Mellon University

Positivity and non-positivity results for the sixth-order Q-curvature of conformal metrics

Given $n, m \in \mathbb{N}$ such that $n \geq 2m \geq 4$, letting g be a conformally Euclidean metric on $\mathbb{R}^n$, we consider the question of positivity of the lower-order Q-curvatures $Q_g^{(2k)}$ for $k \in \{1, \dots m-1\}$ when $Q_g^{(2m)}$ is assumed to be nonnegative and not identically zero. We assume moreover that the scalar curvature of the metric g is nonnegative near infinity if $n = 2m$ or that $Q_g^{(2m)}$ satisfies a slow decay barrier condition near infinity if $n > 2m$. A positive answer to this question for the second and fourth order Q-curvatures was obtained by Li and Xu. Considering the case where $m \geq 4$ and $k = 3$, we obtain a positive result for this question when $n \in \{2m, 2m+1, \dots, 4m-6\}$. On the other hand, in surprising contrast with previous literature, we find that the answer to this question is negative when $k = 3$ and $n \geq N_m$ for some $N_m \in \mathbb{R}$. This talk is based on a joint work with Jérôme Vétois.