QUANTITATIVE STABILITY FOR METRICS OF ALMOST-CONSTANT FRACTIONAL SCALAR CURVATURE

It is well-known that the only entire positive solutions u to the fractional Yamabe equation

$$(-\Delta)^s u = u^{\frac{n+2s}{n-2s}} \qquad \text{on } \mathbb{R}^N$$

are given by the manifold $\mathcal{M}$ consisting of the standard Talenti bubble $B(x) = (1+|x|^2)^{-\frac{n-2s}{2}}$ and translations and dilations thereof. In this talk, I will present a recent result about the corresponding quantitative stability inequality, namely

$$\mathrm{dist}_{\dot{H}^s(\mathbb{R}^N)}(u, \mathcal{M})^2 \leq C \|(-\Delta)^s u - u^{\frac{n+2s}{n-2s}}\|^2_{\dot{H}^{-s}(\mathbb{R}^N)}.$$

I will explain how this inequality can also be read as a stability result for conformally flat metrics with almost-constant fractional curvature. Moreover, I will present an application to determining an explicit polynomial extinction rate for solutions of the fractional fast diffusion equation. This talk is based on joint work with Nicola De Nitti (FAU Erlangen).