KRYSTAL TAYLOR, University of Rochester

Rotational curvature, Falconer's Distance problem, and Dimensions of sets

Let $E \subset [0,1]^d$, $d \geq 2$ and consider

$$D_t^{\phi}(E) = \{(x,y) \in E \times E : \phi(x,y) = t\}.$$

We shall see that under some regularity assumptions on the function ϕ , the upper Minkowski dimension of D_t^{ϕ} is less than or equal to $2dim_{\mathcal{H}}(E) - 1$ provided that the Hausdorff dimension of E is sufficiently large. We will also discuss connections between this inequality and the Falconer distance problem.