IMAR Monthly Lecture

On a non-resonant Carleson-Radon transform and the curved n-linear Hilbert transform

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Abstract: In this talk we discuss the following two themes:

- (*joint with my graduate student Martin Hsu*) the boundedness of the 2D non-resonant Carleson–Radon transform:

$$CR(f)(x,y) := \sup_{a\in\mathbb{R}} \left| \text{p.v.} \int_{\mathbb{R}} f(x - t^{\alpha_1}, y - t^{\alpha_2}) \frac{e^{a\,i\,t^{\alpha_3}}}{t}\, dt \right|, \quad (x,y) \in \mathbb{R}^2\,,$$

  where here $\{a_j\}_{j=1}^3 \subset \mathbb{R}_+$ are pairwise distinct;
- (*joint with my former postdoc Bingyang Hu*) the boundedness of the $n-$linear Hilbert transform along the moment curve:

$$T_C(f_1, f_2, \ldots, f_n)(x) := \text{p.v.} \int_{\mathbb{R}} f_1(x - t) f_2(x + t^2) \ldots f_n(x + t^n) \frac{dt}{t}, \quad x \in \mathbb{R}\,.$$

Our approaches for the problems above are based on the LGC methodology introduced by the speaker and further developed in various collaborative works.