Analysseminariet

Stefano Meda, Politecnico di Milano: On the Kunze–Stein phenomenon

Abstract: Let G be the group $SL(2,\mathbf{R})$. In 1960 R. Kunze and E. Stein proved that if $1 \leq p < q \leq 2$, then

$$L^p(G) * L^q(G) \subseteq L^q(G).$$

This surprising fact is related to the nonamenability of the group G. This result has been recently improved in a joint work with M. Cowling of the University of New South Wales in Sydney and A. Setti of the Università di Milano. We show that if $1 \leq p < 2$ and $1 \leq r, s, t \leq \infty$, then

$$L^{p,r}(G) * L^{p,s}(G) \subseteq L^{p,t}(G)$$

if and only if $1/t \leq 1/r + 1/s - 1$. Here $L^{p,u}(G)$ denotes the standard Lorentz space with respect to the Haar measure of G.

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