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*Prescribing the radial limits of solutions to a PDE*

Let $S^{n-1}$ be the unit sphere in $\mathbb{R}^n$, and $(\theta, r)$ be the polar representation of points in $\mathbb{R}^n$, for $\theta \in S^{n-1}$, and $r \geq 0$. Moreover, let us call $L$-harmonic functions the solutions of the PDE $Lu = 0$.

Now, let suppose $U = (U', R)$ is a strictly starlike domain in $\mathbb{R}^n, n \geq 2$, and let $F'$ be an $F_\sigma$ subset of $U'$, which is of first category if $n = 2$, and polar if $n > 2$. Then, we shall introduce a class of partial differential operators $L$ such that for every function $\varphi$ continuous on $U$, there is a $L$-harmonic function $h$ on $U$ such that, for all $\theta \in F'$, we have

$$\big(h - \varphi\big)((\theta, r)) \to 0.$$

as $(\theta, r)$ goes to the boundary of $U$. That is, the radial limits of $h$ can be prescribed by a continuous function.

***This is a joint work with Paul. M. Gauthier.***