

Tangentail boundary behavior of smooth functions

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If analytic (harmonic, temperature,...) function is globally bounded in a some sense, then it has the Fatou property: almost ewerywhere on the boundary there exist limits along a certain family of domains of the approach to the boundary. For example, in the case of subspace of \mathbb{R}^{n+1} such domains are nontangential Luzin cones, or Koranyi–Stein domais are admissible domains in a complex ball $B^n \subset \mathbb{C}^n$. In each situation these Fatou domains are sharp and it is impossible to enlarge them.

To have the Fatou property for extended Fatou domains, it is necessary to require the additional smoothness conditions. The connection between boundary behavior and smoothness was started to study systematically relatively recently (Nagel–Rudin–Shapiro (1982), Nagel–Stein (1984)).

In the talk will be considered an abstract version of such problem, and many examples of boundary behavior of different potentials (Bessel, Newton, fractional integrals Cauchy-Szego) and of some boundary value problems for elliptical equations.