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$\mathcal{Q}_p$ n-dimensional classes

Let $n \geq 3$ and B be the unit ball in $\mathbb{R}^n$. Denote by $\mathrm{GM}(B) = \{\phi_{a^*}\}$ the group of all Möbius transformations of the unit ball onto itself and $\mathcal{SH}$ the class of subharmonic functions $u\colon B \to \mathbb{R}$. Consider

$$g(x,a^*) = |\phi_{a^*}(x)|^{2-n} - 1 = \frac{1}{|\phi_{a^*}(x)|^{n-2}} - 1,$$

the modified solution of the Laplacian in $\mathbb{R}^n$ compose with a Möbius transformation ϕ_{a^*} of the unit ball onto itself. Let $0 \leq p < \infty$. We say that the function u belongs to the subharmonic class $\mathcal{Q}^{sh}_{p,g}$ if $u \in \mathcal{SH}$ and

$$\sup_{|a^*|<1} \int_B u^2(x)\Big(\frac{1}{|\phi_{a^*}(x)|^{n-2}} - 1\Big)^p \, dB_x < \infty.$$

In this talk we present several properties of this class and associated subclasses, like Dirichlet and Bloch classes. Classical $\mathcal{Q}_p$-analytic spaces in $\mathbb{C}$ were introduced by Aulaskari and Lappan. In higher dimensions, $\mathcal{Q}_p$-monogenic spaces were studied using Quaternionic and Clifford analysis. Since the subharmonic class is a very wide class, the results presented here are quite more general.