A dyadic approach to the space H^{log}

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The Hardy-Orlicz space

$$H^{log}(\mathbb{D}) = \left\{ f : \mathbb{D} \to \mathbb{C} \text{ analytic}, \sup_{0 \le r < 1} \int_0^{2\pi} \frac{|f(re^{it})}{\log(e + |f(re^{it})|)} dt < \infty \right\}$$

was identified as the space of products $BMOA(\mathbb{D}) \cdot H^1(\mathbb{D})$ in the work of Bonami and collaborators [1], creating a profound connection to the theory of Hankel operators. In this talk, we want to present a dyadic approach to this space, which allows also a consideration of the product setting. This has so far been out of reach.

The talk is based on joint work with Odysseas Bakas (University of Patras, Greece), Salvador Rodriguez, and Alan Sola (both Stockholm University, Sweden).

[1] O. Bakas et al., Notes on $H^{\log}$: structural properties, dyadic variants, and bilinear H^1-BMO mappings, Ark. Mat. **60** (2022), no. 2, 231–275; MR4500365

[2] A. Bonami et al., On the product of functions in BMO and H^1, Ann. Inst. Fourier (Grenoble) **57** (2007), no. 5, 1405–1439; MR2364134

[3] S. Pott and B. F. Sehba, Logarithmic mean oscillation on the polydisc, endpoint results for multi-parameter paraproducts, and commutators on BMO, J. Anal. Math. **117** (2012), 1–27; MR2944088