

Localized Fréchet frames for spaces of generalized functions

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Frames generalize orthonormal bases. Initially introduced in Hilbert spaces, they were subsequently defined in Banach and Fréchet spaces. Frames allow redundancy (which is very useful and crucially important for certain applications) and still guarantee perfect and stable reconstruction of all elements in a Hilbert space. However, they do not always lead to series expansions in Banach and Fréchet spaces. In this talk we consider a special class of (Hilbert) frames, so called localized frames, which also provide expansions in appropriately determined Banach spaces (Gröchenig, 2004). We present some results (joint work with Stevan Pilipovic, 2021) that show that such localized frames form Fréchet frames and provide series expansions in certain spaces of generalized functions. Furthermore, we consider asymptotic analysis of distributions via localized frames (joint work with Veta Buralieva, Hadzi-Velkova Saneva, and Atanasova, 2024). The speaker acknowledges support from the Austrian Science Fund (FWF) through Project P 35846-N “Challenges in Frame Multiplier Theory”, grant DOI 10.55776/P35846.

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