15 **Wolfram Bauer**

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: [Fundamental solution of a class of ultra-hyperbolic operators on pseudo-H-type groups](#)

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abstract

Pseudo-H-type Lie groups $G_{r,s}$ of signature (r,s) are defined via a module action of the Clifford algebra $C\ell_{r,s}$ on a vector space $V \cong \mathbb{R}^{2n}$. They form a subclass of all 2-step nilpotent Lie groups and based on their algebraic structure they can be equipped with a left-invariant pseudo-Riemannian metric. Let $\mathcal{N}_{r,s}$ denote the Lie algebra corresponding to $G_{r,s}$. A choice of left-invariant vector fields $[X_1, \cdots, X_{2n}]$ which generate a complement of the center of $\mathcal{N}_{r,s}$ gives rise to a second order operator
\begin{equation*} \Delta_{r,s}:= \big{(}X_1^2+ \cdots + X_n^2\big{)}- \big{(}X_{n+1}^2+ \cdots + X_{2n}^2 \big{)}, \end{equation*}
which we call ultra-hyperbolic. In terms of classical special functions we present families of fundamental solutions of $\Delta_{r,s}$ in the case $r=0$, $s>0$ and study their properties. In the case of $r>0$ the operator $\Delta_{r,s}$ admits no fundamental solution in the space tempered distributions. Finally, we discuss the question of local solvability of the operator. This is a joint work with I. Markina (University of Bergen) and A. Froehly (formerly Leibniz Universit\"{a}t Hannover).

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