

SEMINAR

Grupo de Análise Funcional e Aplicações Functional Analysis and Applications Group

On application of the Gohberg–Krupnik local principle in the Fredholm study of Wiener–Hopf operators on variable Lebesgue spaces

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Abstract

Let $L^{p(\cdot)}(\mathbb{R})$ be a variable Lebesgue space generated by a variable exponent $p(\cdot) : \mathbb{R} \rightarrow (1, \infty)$ bounded away from 1 and ∞ and such that the Hardy–Littlewood maximal operator M is bounded on $L^{p(\cdot)}(\mathbb{R})$. Let $\mathcal{M}_{p(\cdot)}$ denote the corresponding Banach algebra of Fourier multipliers. We introduce “interpolation friendly” classes of Fourier multipliers $\mathcal{M}_{[p(\cdot)]}$ and $\mathcal{M}_{\langle p(\cdot) \rangle}$ such that $\mathcal{M}_{[p(\cdot)]} \subset \mathcal{M}_{\langle p(\cdot) \rangle} \subset \mathcal{M}_{p(\cdot)}$. By using the Gohberg–Krupnik local principle in the Calkin algebra, the Fredholm study of Wiener–Hopf operators $W(a)$ with symbol $a \in \mathcal{M}_{\langle p(\cdot) \rangle}$ on the variable Lebesgue space $L^{p(\cdot)}(\mathbb{R}_+)$ is reduced to that of $W(a_\xi)$ with certain, potentially easier to study, local representatives $a_\xi \in \mathcal{M}_{[p(\cdot)]}$ of a at all points $\xi \in \mathbb{R} \cup \{\infty\}$. This is a joint work with Márcio Valente.

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