Boulkhemair, A.
Remarks on a Wiener type pseudodifferential algebra and Fourier integral operators. (English) Zbl 0905.35103
Math. Res. Lett. 4, No. 1, 53-67 (1997).

In the paper [ibid. 1, 185-192 (1994)] *J. Sjöstrand* introduced a class of pseudodifferential operators with symbols defined without any references to derivatives. This class of symbols S_w is defined in the following way: $u : \mathbb{R}^n \to \mathbb{C}$ is in S_w if for some $\chi \in S(\mathbb{R}^n)$ with nonzero integral

$$\xi \to \sup_{\xi \in \mathbb{R}^n} |\mathcal{F}(u\tau_k\chi)(\xi)| \tag{1}$$

is an integrable function in $\mathbb{R}^n$. Here, $\mathcal{F}$ denotes the Fourier transformation and $\tau_k\chi(x) = \chi(x - k)$. Equipped with the norm equal to the Lebesgue integral of (1), S_w is a Banach space. The class S_w contains the Hörmander class $S_{0,0}^0$. Moreover the operators in OPS_w are bounded in L_2, and if $A \in OPS_w$ is invertible, then $A^{-1} \in OPS_w$. The author gives the following equivalent characteristic of the class S_w. He defines the class $\mathcal{A}$ of function $u : \mathbb{R}^n \to \mathbb{C}$ such that for some $\chi \in S(\mathbb{R}^n)$ with nonzero integral

$$k \to \sup_{x \in \mathbb{R}^n} \left| \mathcal{F}^{-1}[\mathcal{F}(u)\tau_k\chi](x) \right| \tag{2}$$

is an integrable function in $\mathbb{R}^n$. The author proves that the classes S_w and $\mathcal{A}$ coincide. Moreover, he gives a very convenient proof for the boundedness in L_2 of the following symbols in S_w. Further, the author considers Fourier integral operators with amplitudes in S_w and proves their boundedness in L_2.

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MSC:

35S05	Pseudodifferential operators as generalizations of partial differential operators
47G30	Pseudodifferential operators
35S30	Fourier integral operators applied to PDEs

Cited in **2** Reviews
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Keywords:

symbols; Hörmander class; boundedness in L_2

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