Quasi-Banach modulation spaces on LCA groups and pseudodifferential operators

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We define the modulation spaces $M_m^{p,q}$ on a LCA group $\mathcal{G}$ for $0 < p, q \leq \infty$. Connections and equivalences with the classical theory for $p, q \geq 1$ by Feichtinger 1983 are investigated, moreover the Euclidean, discrete and compact cases are fully recovered. We then apply this theory to the study of boundedness properties of pseudodifferential operators. Finally, decay properties for eigenfunctions of localization operators are investigated.