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Amalia Culiuc, Francesco Di Plinio* (fradipli@brown.edu) and **Yumeng Ou**, Brown University Mathematics Department. *Modulation invariant Carleson embedding theorems and applications*. Preliminary report.

We develop a localized theory of Carleson embeddings for the wave packet transform, in the setting of outer measure spaces introduced by Do and Thiele. Our main embedding theorem involves a novel modulation invariant version of the Calderón-Zygmund decomposition. As an application, we prove estimates for multilinear modulation invariant singular integral operators, like the bilinear Hilbert transform, by multilinear positive sparse operators. This, in particular, entails a novel rich sharp weighted theory for the bilinear Hilbert transform. (Received January 11, 2016)