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Akram Aldroubi* (akram.aldroubi@vanderbilt.edu), Dept. of Mathematics, Vanderbilt University, Nashville, TN 37240, and **Romain Tessera**. *Sparse approximations and the minimum subspace approximation property.*

Let \mathcal{C} be a set of closed subspaces of a separable Hilbert space \mathcal{H} . We find a topological characterization of the following property of \mathcal{C} : for every finite subset $F \subset \mathcal{H}$, there exists a subspace $V^o \in \mathcal{C}$ that minimizes the expression

$$\sum_{f \in F} d^2(f, V), \tag{1}$$

over all $V \in \mathcal{C}$. We say that \mathcal{C} has *MSAP* (MSAP stands for Minimum Subspace Approximation Property) if that property holds for all finite subsets F . The MSAP has applications in sparse approximation, compressed sampling, dictionary design, and the Generalized Principle Component Analysis. (Received August 28, 2009)