962-42-1293 **David F Walnut*** (dwalnut@gmu.edu), Department of Mathematics, Geoerge Mason University, MSN 3F2, Fairfax, VA 22030. *Local Pompeiu Problems and Sampling.* Preliminary report.

General Pompeiu problems ask when a function can be completely determined from its averages over all rigid motions of a finite collection of compact sets. The local problem asks when can a function be completely determined on an open set U by those rigid motions of a finite collection of compact sets which are completely contained in U. There are many variations on the local and global Pompeiu problems. In this abstract, we consider certain cases of the local Pompeiu problem when only translations are considered. We show that this problem can be reduced to a problem of the completeness of collections of functions in $L^2(\overline{U})$ which collections are closely related to the sampling theory of functions bandlimited to $\overline{U}$. This analysis shows in particular that the recovery of functions from their local averages is ill–posed but only mildly so. (Received October 03, 2000)