

**Meeting:** 1003, Atlanta, Georgia, SS 5A, AMS Special Session on Radon Transform and Inverse Problems, I

1003-41-1524      **David Walnut\*** (dwalnut@gmu.edu), Department of Mathematical Sciences, MSN 3F2, George Mason University, Fairfax, VA 22030. *Local reconstruction from averages and sampling theory*. Preliminary report.

This work discusses generalizations of the Local Three Squares Theorem, proved by C. Berenstein, R. Gay, and A. Yger which asserts that a function is uniquely determined locally by its averages over shifts of three squares with parallel sides if and only if the side lengths of the squares are pairwise irrationally related. We discuss this theorem and generalizations in the context of the theory of sampling of bandlimited functions in higher dimensions, in particular a generalization in which the squares are replaced by parallelograms in the plane. This generalization is related to a recent result of Y. Lyubarskii and A. Rashkovskii describing sets of sampling and interpolation for functions bandlimited to symmetric even-sided polygons in the plane. This preliminary report is based on joint work with Bjarte Rom of NTNU Trondheim. (Received October 05, 2004)