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**Eli Ben-Sasson** and **Elena Grigorescu\*** (elena@cc.gatech.edu), 266 Ferst Drive, KACB 2113, Atlanta, GA 30332, and **Ghid Maatouk**, **Amir Shpilka** and **Madhu Sudan**. *On Sums of Locally Testable Affine Invariant Properties*.

Affine invariant properties are collections of functions mapping a large field to a subfield, that are invariant under affine transformations of the domain. These properties generalize well-studied codes such as Hadamard, Reed-Muller and BCH. Almost all known ‘locally testable’ affine-invariant properties have a structural property called ‘single-orbit characterization’, which means that they are generated as a vectors space by one function and its translations under the affine group. In this talk I will describe new affine invariant families that have a single-orbit characterization. By previous results these families form the most general examples of locally testable affine invariant codes known so far. I will further describe some intriguing open questions suggested by these results. (Received September 18, 2011)