1099-47-227 **Jireh Loreaux** and **Gary Weiss*** (weissg@ucmail.uc.edu), Mathematics Dept ML 25, University of Cincinnati, Cincinnati, OH 45221. *Diagonalability and Idempotents.* Preliminary report.

Diagonability of an operator here means the study of the properties that its diagonal sequences can have.

0-diagonalability (an operator having zero diagonal in some basis) is one such property. In an attempt to begin a classification of diagonals of idempotents, which is equivalent to a problem in frame theory, J. Jasper asked the following questions: (i) If an idempotent operator has an absolutely summable diagonal in some basis, must it be finite rank? And (ii) If an idempotent operator is 0-diagonalizable, must it be finite rank? These questions were spurred by the case when the idempotent is a projection, where the answer to each question is certainly affirmative. In this lecture we give one example and show how the techniques developed by Fan and Fong (related to work of Fan-Fong-Herrero) on 0-diagonability settle Jasper's question for idempotents.

Main Theorem. For D idempotent, B its off diagonal part wrt its standard decomposition 2x2 matrix block I,B,0,0, and R(Tr D) denotes the set of traces in all bases,

TFAE (i) D is not a Hilbert-Schmidt perturbation of a projection. (ii) B is not Hilbert-Schmidt. (iii) R(Tr D) is the plane. (iv) D has a zero diagonal. (v) D has an absolutely summable diagonal. (vi) R(Tr D) is nonempty. (Received February 10, 2014)