Meeting: 1001, Evanston, Illinois, SS 8A, Special Session on Computability Theory and Applications

1001-37-332 **Dmitriy V Akimov***, 37 A University Village, Fargo, ND 58102. *Properties of the von Neumann-Kakutani adding machine transformation.*

This paper contains three parts. In the first one we give a detailed description of an example of ergodic measure preserving transformation which is weakly mixing but not strongly mixing. The idea of this example goes back to John von Neumann who discussed it with S. Kakutani in the early 1940's. In S. Kakutani's paper in 1973 the so called "adding machine" transformation (or odometer) has been used to construct such an example, and the part of the paper studies the translations of the tori. The conditions for ergodicity of these transformations are well known. We give an "elementary" proof of ergodicity under these conditions. "Elementary" means that only basic properties of Lebesgue measure are used, while many standard proofs are based on L^2-theory. Finally, the third part has some results related to cohomology equations and coboundary cocycles. Some applications to entropy theory are also discussed. (Received August 30, 2004)