Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

**Fracture behaviour of ceramic metal composites under impact loading.** RYNNO LOHMUS, Institute of Physics Univ. of Tartu, IRINA HUSSAINOVA, Department of Materials Engineering, Tallinn University of Technology — This paper covers research into tribological properties and fracture behaviour of ceramic - metal composites with the hard ceramic phase of titanium, tungsten and chromium carbides studied under the solid particle impact of controlled energy. Surface damage or material removal during particle – target collision is the result of material response to the contact stresses. Energy dissipation under two bodies collision may be estimated by means of the coefficient of velocity restitution. Approach of impact dynamic and experimental study of dynamic coefficients have been applied to clarify the composite material behaviour under conditions of solid particle erosion. Microstructural factors such as grain boundary chemistry and grain boundary structure can play a significant role in determining the fracture behaviour of multiphase materials. The influence of the boundary parameters on the tribological performance of cermets results from the creation of internal stress state at grain boundaries by the thermal expansion anisotropy between individual carbide grains and carbide – metallic binder. The internal state of material depends on microstructural characteristics of multiphase materials.

Rynno Lohmus
Institute of Physics Univ. of Tartu

Date submitted: 30 Nov 2004 Electronic form version 1.4