Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Mean-field description of Anderson localization transition JINDRICH KOLORENC, Center for High Performance Simulation and Department of Physics, North Carolina State University, Raleigh, NC 27695-8202, VACLAV JANIS, Institute of Physics, Academy of Sciences of the Czech Republic, Na Slovance 2, CZ-18221 Praha 8, Czech Republic — The Anderson model of noninteracting disordered electrons is studied in high spatial dimensions. In this limit the coupled Bethe-Salpeter equations determining two-particle vertices (parquet equations) reduce to a single algebraic equation for a local vertex. We find a disorder-driven bifurcation point in this equation signaling vanishing of electron diffusion and onset of Anderson localization. There is no bifurcation in $d = 1, 2$ where all states are localized. In dimensions $d \geq 3$ the mobility edge separating metallic and insulating phase is found for various types of disorder and compared with results of other treatments.

Jindrich Kolorenc
Center for High Performance Simulation and Department of Physics
North Carolina State University, Raleigh, NC 27695-8202

Date submitted: 03 Dec 2005 Electronic form version 1.4