Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

**$C_{60}$ fullerene under high multi-shock pressures** V. AVDONIN, A. MOLODETS, A. ZHUKOV, J. SHULGA, V. FORTOV, IPCP RAS — The present work is devoted to a versatile research of electrophysical and thermodynamical properties of C60 fullerene under a high multi-shock pressures. Our multi-shock experiments has shown that C60 fullerite is preserving its crystal structure and molecules under a dynamic loading up to 30 GPa unlike the high static pressure conditions. The measurements of an electroconductivity of C60 fullerene under these conditions was carried out. It is experimentally established that decreasing of a conductivity of C60 fullerene has been changed by a sudden increasing one under the pressure of multi-shock compression above 20 GPa. A semiempirical equation of the state of fcc C60 fullerite was constructed. The analysis of the thermodynamic fullerene conditions under the high multi-shock pressures was done with help of a present EOS. Thus, at the present work we found that the crystal and molecular structure of C60 fullerene demonstrates a stability under short (microsecond) high multi-shock loading. The data of crystal form properties of C60 fullerene under such extreme conditions unachievable under static loading has been obtained. The work is supported by the program of Presidium of Russian Academy of Sciences "Investigations of a matter under extreme conditions."

Vladimir Avdonin
IPCP RAS

Date submitted: 20 Feb 2009 Electronic form version 1.4