

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**The divergence representation of the exact stress force: Implications for density-functional theory** ILYA TOKATLY, Chair for Solid State Theory, University of Erlangen-Nurnberg, Staudtstr. 7/B2, Erlangen — We prove that the local stress force in a quantum many-body system is representable in a form of a divergence of a symmetric second rank tensor, provided that the interparticle interaction satisfies the Newton's third law. The above divergence theorem allows to formulate the exact local constraints on the exchange-correlation potentials both in the static and in time-dependent density functional theory. We show that the well known zero-force and zero-torque sum rules represent a particular consequence of our new local condition.

Ilya Tokatly  
University of Erlangen-Nurnberg

Date submitted: 20 Dec 2004

Electronic form version 1.4