

## Abstract

Master-class under the International workshop on physics of turbulent mixing of compressed media IWPCTM12, Moscow, July 2010.

### **“Complex of laboratory activities on gas dynamics (including problems of hydrodynamic instability) based on simple and safe methods of experimental and numerical simulation of physical processes in MASTER Professional medium”**

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SarPhTI NRNU MEPhI has developed a complex of laboratory activities studying gas-dynamic problems. The practicability to study these problems within the framework of the university course is limited to the safety issues. Traditional laboratory methods of the gas-dynamic study are connected with risks (electric explosion, compressed gases, etc.)

The specific feature of this method is a combined experimental and numerical simulation. As an experimental tool an atmosphere shock tube is applied (E.E. Meshkov, G.B. Krasovsky A method of laboratory gas-dynamic problems simulation and a device for its implementation (versions). // *Application №2008130214 of 21.07.200, positive decision has been obtained*). An energy source is the energy is ambient air. The complex includes relatively inexpensive digital video equipment. The computer simulating complex is based on the MASTER Professional software [1] for personal computers designed for a wide range of users. It has a convenient intuitive user interface and a wide set of numerical methods and means for visualization of simulated phenomena.

The combined experimental and numerical simulation makes the process of education more efficient, allows application of current investigation techniques and deep understanding of the investigated processes and phenomena.

1. V.V. Rudenko, M.B. Shaburov, E.V. Chekhunov The Educational and Research software MASTER on continuum physics. Proceedings of the Regional conference on scientific software. February 2-3, 2006, St. Petersburg Polytechnic Institute Publishing company P.121-124.