Contribution ID: **7** Type: **Oral**

Nuclear Synthesis On Ordered Crystal Target With Participation Of Monochromatic Beams Of Light Or Middle Isotopes

Monday, 1 October 2012 15:00 (30 minutes)

In ordered crystal lattice very strong influence of crystal axes and planes electrical field on motion and interaction of fast charged particles with crystal atoms and nuclei exists. In works [1,2] it was shown that in monocrystal targets like possibility of fusion process with the participation of both target nuclei (e.g.) and beam of fast nuclei (e.g.), directed at Lindhard angle, increases by 10-100 times relative to the possibility of alternative process of deceleration on atomic electrons. Such changes are based on the usage of specific channeling physics regime of motion - "overbarrier motion". At such regime the processes of spatial redistribution and dechanneling of accelerated ions take place. In the report the methods of optimization and practical realization of such nuclear fusion are discussed in details.
The additional method of radical optimization of fusion processes with the participation of monochromatic beams of middle mass isotopes is proposed. It is well known that the presence of the Coulomb barrier is the main obstacle to performing nuclear reactions of synthesis with low energy of interacting nuclei. In order to make such reaction possible, it is necessary to place interacting particles in the same spot simultaneously (within the range of atomic force action). In this case, the cross section of nuclear reaction depends on the energy of reciprocal movement of nuclei and matches the "internal atomic cross section". The features of optimized nuclear fusion model, with the use of accelerated average-mass ions beams and condensed-surface targets,

Primary authors: Dr BARTALUCCI, Sergio (LNF); Prof. VYSOTSKII, Vladimir (Kiev National Shevchenko University, Kiev, Ukraine)

Presenter: Dr BARTALUCCI, Sergio (LNF)

Session Classification: Laboratory Report 1