Referee Report on the Theme 5.2

"Status of the Super Heavy Factory Separators"

A key component of the wide complex detection systems at the SHE factory is the newly designed gas-filled separator DGFRS-2. To take full advantage of the increased intensity of the beams being available the increment of the several important parameters such as transmission, dispersion and sensitivity of the spectrometer required a new design with respect to the previous DGFRS so successfully employed to discover new nuclides up to Og.

To the new design, production and installation of all the components has successfully followed. The working team has reported on the installation and individual test of the full set of equipment, up to the data acquisition system for the registration of the events following implantation of nuclei. The working group has achieved this crucial result which deserves congratulations and appreciation of the whole nuclear physics scientific community.

The new phase is now the test of DGFRS-2 under beam and the measurement of the true parameters. As stated, this phase will be accomplished with reactions already used for synthesis of superheavy elements and are well known by the working group. This phase will hopefully bring also to the discovery of new isotopes and additional studies on the chemistry of superheavy elements.

The detailed knowledge of the capabilities of this new spectrometer are of crucial importance to establish the optimal working conditions to exploit new reactions suitable to discover elements heavier then Og.

I therefore recommend full support for the instrumental and experimental program foreseen for the year 2019.

January 17, 2019 Emanuele Vardaci