

XXV International Baldin Seminar on High Energy Physics Problems  
"Relativistic Nuclear Physics and Quantum Chromodynamics"



XXV International Baldin Seminar  
on High Energy Physics Problems  
*Relativistic Nuclear Physics & Quantum Chromodynamics*

September 18 - 23, 2023, Dubna, Russia

Contribution ID: 102

Type: **not specified**

## SHiP experminet and the problem of high-dimensional Muon Shield optimization

*Tuesday, 19 September 2023 16:30 (20 minutes)*

SHiP and the associated SPS Beam Dump Facility is a new general-purpose experiment proposed at the SPS to search for "hidden" particles as predicted by a very large number of recently elaborated models of Hidden Sectors which are capable of accommodating darkmatter, neutrino oscillations, and the origin of the full baryon asymmetry in the Universe. The detector incorporates two complementary apparatuses which are capable of searching for hidden particles through both visible decays and through scattering signatures from recoil of electrons or nuclei. Moreover, the facility is ideally suited to study the interactions of tau neutrinos.

SHiP is declared as an experiment with zero background. The Muon Shield is the key element to achieve this. So on the one hand it have to provide a good background suppression, on the other hand not to be too heavy. The presentation will discuss the issues of Muon Shield optimization, selecting the objective function, considering its constraints from an experimental point of view. Various approaches to global optimization and techniques for accelerating the computational component of the problem will be presented.

**Primary authors:** KURBATOV, EVGENIY (National Research University 'Higher School of Economics, Russia, Moscow); Dr RATNIKOV, Fedor (National Research University 'Higher School of Economics, Russia, Moscow)

**Presenter:** KURBATOV, EVGENIY (National Research University 'Higher School of Economics, Russia, Moscow)

**Session Classification:** Parallel: Progress in experimental studies in high energy centers