**Isotopic Effect in Half-Wave-Crystal Channeling of Relativistic Heavy Ions**

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A half-wavelength crystal (HWC) is a thin crystal where a channeling particle experiences only one collision with a crystallographic plane (“mirroring”) during penetration through a crystal. The HWC channeling was observed for 400 GeV protons at CERN-SPS /1/ and for 255-MeV electrons at the SAGA-LS Facility /2, 3/.

Recent computer simulations of HWC channeling in (100) Si crystal of low-Z H (p, d, t) and Li ( 6Li, 9Li, 11Li) isotopes with kinetic energy *Ek* =300 MeV/u /4/ revealed that the angular distributions of transmitted through HWC isotopes are sensitive to a mass number *A* of the low-*Z* isotope, i.e. there appears an isotopic effect /4/. That means, besides well-known applications of relativistic channeling for beam deflection and splitting, probably the new one is possible– light isotopes mass filter.

Here, we extend studies of HWC-channeling isotopic effect to Ge and W crystals and for isotopes energies up to 25 GeV/u, planned at Super-FRS GSI/FAIR /5/.

REFERENCES

1. W. Scandale et al.// Phys. Lett. B (2014),734, 1.
2. Y.Takabayashi , Yu.L Pivovarov, T.A.Tukhfatullin // Phys. Lett. B (2015) 751, 453.
3. Y.Takabayashi, Yu.L.Pivovarov and T.A.Tukhfatullin // Phys. Lett. B (2018) 785, 347.
4. O.V.Bogdanov, Yu.L.Pivovarov, T.A.Tukhfatullin, H. Geissel, N.Kuzminchuk-Feuerstein, S.Purushothaman, C. Scheidenberger // Phys. Lett. B 802 (2020) 135265
5. Conceptual Design Report for the Scientific Program of the Super-FRS Experiment Collaboration. GSI Report 2016-3. DOI: 10.15120/GSI-2016-03763