Numerical simulation OF hydrogen Diffusion and retention with vAcancy-hydrogen complexes [[1]](#footnote-1)\*)

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The hydrogen isotopes retention and wastage is an important problem for thermonuclear materials. Both, retention and diffusion into a cooling system decrease efficiency of fuel usage. On the other hand, this problem is actual for radiation safety. Number of scientific collectives makes wide researches of hydrogen retention [1, 2]. But there are some difficulties that make experimental modeling insufficient. It’s difficult to simulate total neutron flux with simultaneous ion and plasma flow. So we need to make numerical simulation of the hydrogen diffusion under the same conditions.

In this project, we have analyzed thermo and neutron induced vacancies and how it influence to hydrogen retention and transport. We have made the model, which allow to calculate vacancy concentration in iron. The model takes into account temperature and hydrogen concentration. As the second step, we have found vacancies influence to hydrogen retention. The key features of the model is multihydrogen-vacancy complexes and hydrogen-vacancy complexes influence to the rate of vacancy to sink diffusion. In the future we will spread the model to other materials.

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References

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVII/Mu/ru/AO-Suslin.docx) [↑](#footnote-ref-1)