Evolution of the design of the upper and lower VNC [[1]](#footnote-1)\*)

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1Taskaev A.S., 1Ivantsivskiy М.V., 1,2Burdakov A.V., 1Shiyankov S.V., 1Seleznev P.A., 1Grekhova M.V., 1,3Shoshin A.A., 4Nemtsev G.E., 5Smirnov A.B., 5Pozhilov A.A., 5Kirienko I.D., 5Modestov V.S.

1Budker Institute of Nuclear Physics SB RAS, Novosibirsk, RF,  
2Novosibirsk State Technical University, Novosibirsk, RF,  
3Novosibirsk State University, Novosibirsk, RF,  
4Institution «Project Center ITER», Moscow, RF,  
5St. Petersburg Polytechnic University, Saint Petersburg, RF

The Vertical Neutron Camera (VNC) for the ITER will consist of two parts (upper and lower), each of them will contain six detector units combined into hermetic diagnostic modules equipped with a service vacuum system and water cooling system. The upper VNC will be installed in the upper port (UP) №18 and should be part of the DSM of this port, the lower VNC will be installed in the lower port (LP) №14.

During the development of the design and integration of this diagnostic, the following main changes and results of work were made:

- the front part of the cassettes has been changed - it has a beveled front edge (like that of the DSM), an updated system of water cooling channels has been carried out. On the front of the cassettes, fastening elements were added.

- the geometry of the shielding of the detector modules has been changed. In this design, the geometry of the shielding has been maximized to fill the free space around the detectors to provide improved shielding.

- due to changes in the diagnostic shielding module, the electrical connectors of the UVNC have been moved away from the plasma. Support structures are bolted to the rear of the cassettes, along which the signal cables are run. Mating parts of electrical connectors are installed at the end of the support structures.

- as a result of the work on optimization the design of the UVNC, it was decided to change the cable laying route. In the previous design, the cables were routed above the detectors, which required the detectors themselves to be lowered closer to the plasma. In new design, wires are routed to the sides of the cassettes (to the left and right of the detectors), which allows the detectors to be raised, moving them away from the plasma and improving the signal-to-noise ratio.

- the piping of the service vacuum system has been changed. In this design, three SVS tubes from each of the detectors (on each of the two cassettes) are laid close to the signal cables and next to the support structure, connected to one tube for further welding with the SVS tube of the port integrator.

- the design provides attachment points for diagnostic elements of vacuum ultraviolet radiation, which is being developed by the Korea Domestic Agency.

- the contractor prepared the initial data for the strength analysis of the final design of the upper VNC (in-vacuum elements).

1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLIX/E/ru/ID-Taskaev.docx) [↑](#footnote-ref-1)