HIRDES - The high-resolution double-echelle spectrograph for the World Space Observatory Ultraviolet (WSO/UV)

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The World Space Observatory Ultraviolet (WSO/UV) is a multi-national project grown out of the needs of the astronomical community to have future access to the ultraviolet range of the electromagnetic spectrum. The development of the WSO/UV S/C and the telescope is headed by the Russian Federal Space Agency (Roscosmos). The mission is scheduled to be launched in 2010 into the L2 orbit. The WSO/UV consists of a single Ultraviolet Telescope, incorporating a primary mirror of 1.7 m diameter feeding UV spectrometer and UV imagers. The UV spectrometer comprises three different single spectrographs, two high resolution echelle spectrographs - the High Resolution Double Echelle Spectrograph (HIRDES) - and a low dispersion long slit instrument. Within the HIRDES the spectral band (102 - 310 nm) is separated to feed two echelle spectrographs covering the UV range between 174 and 310 nm (UVES) and the Vacuum-UV range between 102 and 176 nm (VUVES) with a very high spectral resolution of $>$ 50000. Each spectrograph encompasses a stand-alone optical bench structure with a fully redundant high-speed MCP detector system, the optomechanics and a network of mechanisms with different functionalities. The fundamental technical concept is based on the heritage of the two previous ORFEUS-SPAS missions. The phase B1 development activities are described in this paper under consideration of performance aspects, design drivers, the related trade offs (e.g. mechanical concepts, material selection, MCP detector efficiency etc.) and the critical functional and environmental test verification approach. Furthermore the actual state of the other scientific instruments of the WSO/UV (e.g. UV imagers) project is described.