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## PETRA IV: The ultra-low emittance source project at DESY

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The PETRA IV project aims at upgrading the present synchrotron radiation source PETRA III at DESY into an ultra-low emittance source. Being diffraction limited up to X-rays of about 10 keV, PETRA IV will be ideal for 3D X-ray microscopy of biological, chemical, and physical processes under realistic conditions at length scales from atomic dimensions to millimetres and time scales down to the sub-nanosecond regime. In this way, it will enable groundbreaking studies in many fields of science and industry, such as health, energy, earth & environment, transport, and information technology. The science case is reviewed and the current state of the conceptual design is summarised.

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