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Status and Perspective of the FRM II Conversion Project

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Technical University of Munich (TUM) is committed to convert its research neutron source Heinz Maier Leibnitz (FRM II) to a lower enriched fuel. Since 2004, TUM together with its European and International partners develops new high-density fuels and tools for reactor core modelling for the conversion of FRM II. As today, three fuel options are on the way to be qualified for conversion: high-density uranium silicide (U_3Si_2 , with a uranium density of 4.8 - 5.6 gU/cm^3), disperse uranium molybdenum (U-Mo, with a uranium density of 8.0 gU/cm^3) and monolithic U-Mo with a uranium density of 15.5 gU/cm^3 . Extensive irradiation experiments have shown that all three options are suitable for the demanding conditions of high-performance research reactors like the FRM II, but have strongly different potential for decreasing the fuel enrichment. Due to its highest achievable uranium density, TUM is focusing its efforts on the monolithic U-Mo fuel, which allows the lowest enrichment of all options. In parallel, modern computational methods were developed to simulate neutronics and thermal-hydraulics of a conversion core model. In this talk, we will present the most recent results of fuel irradiation experiments, fabrication technologies and core modelling studies, together with a tentative time schedule for the conversion of FRM II.

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