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## Participation of Mexico in the OECD/NEA SFR Benchmark using the Monte Carlo code Serpent

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In 2014, Mexico was honored with its acceptance as an observer member in the Technical Working Group on Fast Reactors of the IAEA. Afterwards, the Mexican participation in the fast reactors activities augmented when in 2016 the Mexican Team was accepted in the UAM SFR Benchmark of the OECD/NEA. The first technical specifications of the mentioned Benchmark consisted of four sodium-cooled fast reactors (3600 MWt metallic-fueled, 3600 MWt MOX-fueled, 1000 MWt carbide-fueled, and 1000 MWt MOX-fueled). The code selected for the full-core simulations was the Finnish Monte Carlo code Serpent version 2.1.26 and the calculations were performed using two different cross sections libraries, namely JEFF 3.1.1 and ENDFB 7.0. The geometry, material composition and Monte Carlo solution parameters used are briefly described in this paper together with the main results obtained by the Mexican team. Quite good agreement (in the order of tens of pcm) for results of keff, sodium void worth, and delayed neutron fraction was observed when comparing with the ones obtained by other participants that followed the same methodology (code and evaluated data libraries). Larger deviations were found when comparing with different methodologies, but in general the calculated solutions were reasonably close to the averaged results reported in the Benchmark. The use of the Monte Carlo code Serpent fulfills two objectives; firstly, to get confidence in the obtainment of reference solutions; and secondly, to generate homogenized cross sections to be used within the currently development of the Mexican neutron diffusion code for hexagonal-z geometry AZNHEX, which is part of the AZTLAN platform: Mexican platform for analysis and design of nuclear reactors. The participation of Mexico in this OECD/NEA Benchmark strengthens the Mexican fast reactors knowledge and allows the country to contribute more actively to the international efforts in the field.

### Country/Int. Organization

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