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# Investigation of divertor movement during disruptions

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The divertor, being the main power exhaust of a tokamak, is exposed to high heat fluxes and therefore must be precisely aligned to prevent leading edges. Since the transition from carbon to tungsten tiles in ASDEX Upgrade it was found that a specific assembly in the divertor was misaligned up to 1.5 mm after the experimental campaigns. This lead to heat spikes on the edges of several tiles and subsequent melting. To understand the origin of this movement, numeric model was created in ANSYS Maxwell containing the full 3D coil setup of ASDEX Upgrade, the plasma current and a segment of the divertor assembly. The plasma current (1.6 MA) was set to decay within 2.5 ms to 10 ms in order to create a poloidal field change of 50 T/s to 200 T/s while the toroidal field was constant at 2.4 T in the divertor region. The simulation revealed a parasitic current flowing from the support structure through the outer tiles. The resulting jxB force can reach up to 2500 N and the torque up to 780 Nm on a single tile depending on the poloidal field change. For carbon tiles, the maximal force and torque are five times smaller due to the higher electric resistivity. A current flowing through the conducting support of the assembly through the vessel wall and back through the assembly causes additional force (max. 5500 N) and torque (max. 2300 Nm). The other support is isolated by SiN plates. A friction test showed a static friction coefficient of 0.1 under normal forces larger than 5 kN. A FEM model, using these results, showed that the friction force at the SiN plates is overcome and the assembly is moved.
The models and detailed results of the calculations will be presented at the conference.

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