Drift wave turbulence studies on the effect of limiter/divertor plates positioning

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The boundary of tokamak plasmas is characterised by electromagnetic interactions between wavelike and fluidlike motions, on space scales from the background profile scale length down to the ion gyroradius. We use the gyrofluid model GEM to investigate electromagnetic turbulence and the associated transport phenomena both in the edge and in the scrape-off layer (SOL) of such region of the plasma. The boundary conditions in the open field lines region (SOL) arise from a Debye sheath where they strike material surfaces. At the such places, rather than the globally consistent periodicity conditions, a standard Debye sheath form is used. The influence on the turbulence and transport of different poloidal positions of the material plates is studied by changing the place, along the field lines, where the Debye sheath boundary conditions are applied. In particular, a case with two limiters (top and bottom), isolating the high field (inboard) and low field (outboard) sides, is addressed. This study highlights the differences between these two regions of the tokamak, where the curvature is either favourable (inboard) or unfavourable (outboard). Moreover, it allows for qualitative experimental comparisons with electron density fluctuations measurements, from both sides (inboard and outboard) of a connected double null magnetic field configuration of the ASDEX Upgrade tokamak, which may be performed using the microwave reflectometry diagnostic.