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Control of turbulent transport by GAMs KLAUS HALLATSCHEK, IPP-Garching — In principle, geodesic acoustic modes (GAM), poloidal flows in tokamaks oscillating at the system sound frequency, are able to control turbulent transport in a similar way as the better known zonal flows - if certain conditions are met. For once, the GAMs must be weakly damped, restricting the safety factor to the relatively high values of the tokamak edge. The GAM frequency should be significantly lower than the turbulence frequencies to avoid averaging effects, and to allow effective feedback amplification of the GAMs, e.g., by diamagnetic drive. Lastly, the drive is significantly boosted in highly nonlinear situations. Using numerical turbulence studies, the effectivity of GAM drive and the dependence of transport on the GAM properties have been analyzed for varying magnetic geometry, plasma parameters, gradients, and magnitude of nonlinear terms. In particular, in the limit of high gradients and favorable circumstances the GAM activity can become so strong as to virtually suppress the transport in comparison to standard scenarios. The transport is then organized in individual bursts associated with the zero crossings of the flow oscillation.

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