A FRICTIONLESS STEERING MECHANISM FOR THE ITER FRONT STEERING ECRH LAUNCHER PROPOSAL

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Although a Front Steering ECRH Launcher offers both higher current drive power deposition and larger steering range for NTM stabilization (a improvement factor of 3 compared to the relative poor efficiency dictated by geometrical constraints of a Remote Steering Launcher concept), sliding movable materials close to the plasma are traditionally considered as a major critical issue for a Front Steering Launcher for ITER.

The proposed frictionless steering mechanism is bearing-free with bellows and flexure pivots, in a compact cartridge capable of $\pm 12^{o}$ rotation, with rectangular-shaped flexible cooling tubes coiled around the body for reducing stresses to levels corresponding to ITER design requirements, offering an adequate safety margin to withstand forces associated with induced currents in the mirror during disruptions.

A pneumatic seal-less actuator using helium integrated into the rotating mirror assembly offers a fast and precise steering response (rotation control) avoiding push-pull rods, linkages representing sliding bearings and remote actuators. The result is a highly reliable and complete self-contained frictionless kinematic assembly. A description of the kinematic & structural behavior of the steering mechanism is presented.