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The heat and particle exhaust in tokamaks is guided to a dedicated region called *the divertor*. Unmitigated, the expected power fluxes impacting the divertor targets during reactor relevant operation exceed present-day engineering limits [1]. Real-time feedback control of *plasma detachment*, a regime characterized by a large reduction in plasma temperature and pressure at the divertor target, is required to maintain a sufficient reduction of these fluxes [2, 3]. During plasma detachment a temperature gradient along the divertor leg is established. This gradient gives rise to a sharp optical emission fall-off, frequently referred to as a front. These fronts are indicative of a local electron temperature, and their location can be used as a measure of detachment strength. A real-time algorithm for detection of these radiation fronts using multi-spectral imaging was recently developed [4], and experimentally demonstrated [5] on the Tokamak à Configuration Variable (TCV) [6] utilizing the multi-spectral imaging diagnostic MANTIS [7].

In this talk, we will show the state-of-the art and further development of using MANTIS for feedback control of the divertor plasma. Including: 1) feedback-control of the C-III emission front using deuterium fueling and the N-II emission front using nitrogen seeding, and 2) the use of system identification techniques to obtain control-oriented models for offline controller design. We conclude with our view towards multi-input, multi-output (MIMO) control of the divertor plasma using MANTIS, fully exploiting its 10 available cameras. Specifically combining multiple spectrally filtered images to obtain real-time information on the loss processes driving detachment.

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