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Investigations of capacitively coupled radio frequency hydrogen and hydrogen/silane discharges SEBASTIAN MOHR, EDMUND SCHÜNGEL, JULIAN SCHULZE, UWE CZARNETZKI, Ruhr-University Bochum — One of the most important challenges in optimizing capacitively coupled radio frequency discharges for applications such as the deposition of thin films is gaining the independent control of flux and energy of ions and reactive species at the surfaces. This independent control can be obtained by using electrically asymmetric discharges which use two consecutive harmonics to excite the plasma; the ion energy can be controlled by the phase between the two frequencies while the flux stays constant. We conduct two-dimensional simulations of such discharges using the simulation tool Hybrid Plasma Equipment Model by Mark Kushner [1]. The focus of our investigations lies on hydrogen and hydrogen/silane plasmas at pressures up to several 100 Pascals as they are used in the production of solar cells. This presentation deals with the question, how characteristics of these discharges such as field reversals influence the independent control of ion energy and flux.

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[1] M. Kushner 2009 *J. Phys. D* **42** 194013

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