To highlight certain similarities in combinatorial representations of several well known two-
dimensional models of statistical mechanics, we introduce and study a new family of models
which specializes to these cases after a proper tuning of the parameters. To be precise, our model
consists of two independent standard Potts models, with possibly different numbers of spins and
different coupling constants (the four parameters of the model), defined jointly on a graph
embedded in a surface and its dual graph, and conditioned on the event that the primal and dual
interfaces between spins of different value do not intersect. We also introduce naturally related
height function and bond percolation models, and we discuss their basic properties and mutual
relationship. As special cases we recover the standard Potts and random cluster model, the 6-
vertex model and loop
O(n) model, the random current, double random current and XOR-Ising model.

Tuesday, October 15, 2019 05:30pm - 06:30pm
IST Austria Campus SR 14, 2 OG., OMP 1, University of Vienna

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