Ising-like transitions in the $O(n)$ loop model on the square lattice

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Using a transfer-matrix analysis of the square $O(n)$ loop model on the square lattice, we explore the phase diagram in the $S(x,n)$ plane, where $Sx$ is the weight of a lattice edge covered by a loop. For $n>>2$ we find Ising-like phase transitions associated with the onset of a checkerboard-like ordering of the elementary loops. This line of phase transitions continues into the range $n<2$, but with exponents that depend not only on $n$, but also on the set of allowed vertices.