

The Shape of Ice

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The striking boundary dependency, the Arctic Circle Phenomenon, exhibited in the Ice model on the square lattice extends to other planar set-ups. This can be shown using a dynamical formulation which we present for the Archimedean lattices. Critical connectivity results guarantee that the Ice configurations can be generated using the simplest and most efficient local actions. Height functions are utilized throughout the analysis. On a hexagon with suitable boundary height the cellular automaton dynamics generates highly nontrivial Ice equilibria in the triangular and Kagom'e cases. On the remaining Archimedean lattice for which the Ice model can be defined, the 3.4.6.4. lattice, the long range behavior is completely different due to strictly positive entropy for all boundary conditions.