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Functional equations for SOS models with domain walls and a reflecting end

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Solid-on-solid (SOS) models in statistical physics describe the
(two-dimensional) interface between two media. To model the shape of the interface we assign a (discrete) height variable to each vertex of a square lattice. The surface tension is taken into account by interactions between these height variables. In case the nearest-neighbouring heights differ by one unit, and the interactions occur between the four vertices around the faces of the lattice, these models have a rich underlying algebraic structure that renders them exactly solvable. We consider specific boundary conditions that preserve this solvability: domain-wall boundaries and one
reflecting end.

After introducing these models we explain how the underlying algebraic
structure – the so-called dynamical reflection algebra – can be used as a source of functional equations characterizing the partition function of that model, and what can be learned from this approach.

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