PDE ON LATTICES WITH BOUNDARY INTERACTION

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Suppose that each point on a lattice corresponds to a dynamical system generated by a PDE on a bounded domain U and there is interaction between the points on some subset V of the boundary of the domain. If it is possible to take natural limits of this interaction, then one will obtain another PDE on V. There seems to be very little literature on problems of this type. I review a paper of mine in Resenhas (1994) on transmission lines on U=(0,1) with resistive coupling at the point 1 and point out some problems that need to be investigated. Not knowing how to discuss qualitative properties of the resulting PDE, special situations are given for which the dynamics can be reduced to the discussion of a partial neutral functional differential equations. We mention some generalizations of these functional differential equations and mention some other applications.

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