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Coordinate Percolation

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In coordinate percolation, i.i.d. random variables are associated with the lines of a grid, and the life or death of each vertex depends on the values assigned to the lines that cross there. Coordinate percolation arises in scheduling problems (in contrast to independent percolation, intended originally as a model for porous material). The main example we will talk about arose in *joint work with Lizz Moseman* (USMA). Lines on the positive quadrant of the plane grid are assigned uniformly random values from $[0, 1]$, and those vertices whose two coordinate values sum to more than some threshold t are killed. We are able to derive a simple closed-form expression for the probability $\Theta(t)$ that there is an infinite open path (directed or not) from the origin, exhibiting a phase transition similar to what is believed to occur for independent percolation on the plane.