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Some colouring problems of unit-quadrance graphs

The quadrance between two points $A_1 = (x_1, y_1)$ and $A_2 = (x_2, y_2)$ is the number $Q(A_1, A_2) = (x_1 - x_2)^2 + (y_1 - y_2)^2$. Let q be an odd prime power and F_q be the finite field with q elements. The unit-quadrance graph D_q has the vertex set F_q^2, and X, Y in F_q^2 are adjacent if and only if $Q(A_1, A_2) = 1$. In this talk, we will discuss various colouring problems for the unit-quadrance graph D_q.