ZERO DIVISOR GRAPHS OF UPPER TRIANGULAR MATRIX RINGS

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ABSTRACT. Let R be a commutative ring with identity $1 \neq 0$ and T be the non-commutative ring of all $n \times n$ upper triangular matrices over R. In this paper, we describe the zero divisor graph $\vec{\Gamma}(T)$ of T. Some basic graph theory properties of $\vec{\Gamma}(T)$ are given, including determination of the girth and diameter. The structure of such a graph is discussed and bounds for the number of edges are given. The structure of the graph $\vec{\Gamma}(T)$ is fully described in the case that T is a 2×2 upper triangular matrix ring over a finite integral domain R; in this case an explicit formula for the number of edges is given.

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