
Let $M$ be an irreducible algebraic monoid with reductive unit group $G$. There exists an idempotent cross section $\Lambda$ of $G \times G$ orbits that forms a lattice under the partial order $e \leq f \iff G e G \subseteq G f G$, where the closure is in the Zariski topology. This cross section lattice is important in describing the structure of reductive monoids. $M$ is said to be $J$-irreducible when $\Lambda$ has a unique minimal nonzero element.

In this talk we will describe when the cross section lattice of a $J$-irreducible monoid will be distributive. We will then describe when this distributive lattice can be written as a product of chains. (Received September 14, 2014)