
Facet Connectedness of Arithmetic Discrete Hyperplanes With Non-Zero Shift

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Abstract

We present a criterion for the arithmetic discrete hyperplane $P(v, \mu, \theta)$ to be facet connected when θ is the connecting thickness $\Omega(v, \mu)$. We encode the shift μ in a numeration system associated with the normal vector v and we describe an incremental construction of the plane based on this encoding. We deduce a connectedness criterion and we show that when the Fully Subtractive algorithm applied to v has a periodic behaviour, the encodings of shifts μ for which the plane is connected may be recognised by a finite state automaton.

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