DUALITY FOR DYADIC POLYTOPES

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Dyadic rationals are rationals whose denominator is a power of 2. Dyadic polytopes are defined as the intersections with the dyadic space of a polytop in the real space whose vertices lie in the dyadic space. Algebraically, dyadic polytopes carry the structure of a commutative, entropic and idempotent groupoid under the binary operation of arithmetic mean. We found a duality for the category of dyadic polytopes, analogues of real convex polytopes. This duality is given by the schizophrenic object, the dyadic unit interval. The representation space is constructed on the set of (relative) groupoid homomorphisms from a polytop to the unit interval, and its structure is analysed.