Matroid approximations for an extension of boolean algebra

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We introduce an extension of Boolean Algebra called System B that is useful for the investigation and construction of solution algorithms for the satisfiability problem of propositional logic (SAT) and for a related logic minimization problem (MINSAT).

One may employ matroid approximations to evaluate and bound the computing effort of such solution algorithms. The matroids are over the ternary field (GF(3)) or over a so-called system BG. The latter system utilizes reals that are algebraically independent over the rationals.

System B is a special case of so-called D-systems. Particular instances of the latter systems may be used to model and solve several combinatorial problems that are different from SAT or MINSAT.