Complex algebras of subalgebras

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Let A be an algebra. On subsets of A we define so called complex operations, by setting f(A,B,C,...) to be the set of all f(a,b,c,...), where a in A, b in B, ... The resulting algebra (of the same signature) is called the complex algebra of subsets. Now consider the set of subalgebras of A - it may or may not be a subalgebra of the complex algebra of subsets. If the former is true, we say that A has the complex algebra of subalgebras. We are interested in the following question: When a variety V has the property that every algebra in V has the complex algebra of subalgebras? And which identities do complex algebras of subalgebras satisfy? The first question is solved by the so called complex condition, a generalizition of the entropic law. We investigate, how far actually is the complex condition from the entropic law. The second question remains partly open.

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