

THE GEOMETRY OF FREE ALGEBRAS IN CHANG VARIETY: A BRIDGE FROM SEMISIMPLICITY TO NON SEMISIMPLICITY

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We focus on $V(C)$, the variety generated by Chang's MV algebra. We provide a construction of free algebras in $V(C)$ via a functor, TLEX, which allows us to deal with infinitesimals, to establish categorical duality between $V(C)$ -algebras and geometric objects, to have a Nullstellensatz in $V(C)$ and a McNaughton type theorem in its logic. The most of used methodology and techniques can be replied in all the varieties generated by non-archimedean MV-chains.

We have seen that in the wild class of non-archimedean MV-algebras, $V(C)$ -algebras have a quite tractable behaviour. Indeed it seems clear that their behaviour parallels that of archimedean ones, at least in the relationships existing among logic, free algebras and their geometry. TLEX functor provides useful and powerful mechanism to generate, manipulate and manage the infinitesimals, i.e. the algebraic and analytical representatives of perturbations of clear truth values. The presented results open the door to an analogous treatment for all varieties of MV-algebras generated by nonarchimedean chains, showing how, in some regards, to pass from results on archimedean MV-algebras to non-archimedean ones.

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