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Augmented down-up algebras and uniform posets

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Abstract

Motivated by the structure of the uniform posets we introduce the notion of an augmented down-up (or ADU) algebra. We discuss how ADU algebras are related to the down-up algebras defined by Benkart and Roby. For each ADU algebra we give two presentations by generators and relations. We also display a **Z**-grading and a linear basis. In addition we show that the center is isomorphic to a polynomial algebra in two variables. We display seven families of uniform posets and show that each gives an ADU algebra module in a natural way. The main inspiration for the ADU algebra concept comes from the second author's thesis concerning a type of uniform poset constructed using a dual polar graph.

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Augmentirane rastoče algebre in uniformne urejene množice

Povzetek

Po zgledu strukture uniformnih delno urejenih množic vpeljemo t.i. *razširjene rastoče algebre* (augmented down-up algebra ali na kratko ADU). Razložimo, kako so ADU algebre povezane z rastočimi (down-up) algebrami, ki sta jih definirala Benkart in Roby. Za vsako ADU algebro prikažemo dve prezentaciji z generatorji in relacijami. Predstavimo tudi Z-razvrstitev (angl. Z-grading) in linearno bazo. Pokažemo tudi, da je center ADU algebre izomorfen algebri polinomov dveh spremenljivk. Predstavimo sedem družin uniformnih delno urejenih množic in pokažemo, da vsaka naravno porodi modul ADU algebre. Glavna inspiracija za vprljavo koncepta ADU algeber prihaja iz doktorske disertacije drugega avtorja, ki obravnava uniformne delno urejene množice, konstruirane s pomočjo dualnega polarnega grafa.