

Tolerance factorable varieties and four ways Béla Csákány influenced their study

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Let Lat denote the variety of lattices. In 1982, the second author proved that Lat is *strongly tolerance factorable*, that is, the members of Lat have quotients in Lat modulo tolerances, although Lat has proper tolerances. We did not know any other nontrivial example of a strongly tolerance factorable variety.

Now we prove that this property is preserved by forming independent joins (also called products) of varieties. This enables us to present infinitely many strongly tolerance factorable varieties with proper tolerances. Extending a recent result of G. Czédli and G. Grätzer, we show that the tolerances of these varieties are exactly the homomorphic images of their congruences.

Our observation that (strong) tolerance factorability is not necessarily preserved when passing from a variety to an equivalent one leads to an open problem.

The four ways mentioned in the title will be detailed.

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