On the monoid of ideals
of orders in quadratic number fields

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This talk is based on a joint work with J. Brantner and A. Geroldinger. Let $\mathcal{O}$ be an order in a quadratic number field. A proper nonzero ideal of $\mathcal{O}$ is called an ideal atom if it is not the product of two proper ideals of $\mathcal{O}$. It is well-known that every nonzero ideal of $\mathcal{O}$ can be written as a finite product of ideal atoms. In this talk we investigate the structure of product decompositions of ideals of orders in quadratic numbers fields into ideal atoms. We discuss and determine several factorization theoretical invariants of the monoid of ideals of $\mathcal{O}$, like the elasticity, the unions of sets of lengths, the set of catenary degrees and the delta set. Furthermore, we apply the aforementioned results to characterize when the minimum of the delta set of $\mathcal{O}$ is bigger than one.

References

1. A. Geroldinger and F. Halter-Koch, *Non-Unique Factorizations. Algebraic, Combinatorial and Analytic Theory*, Pure and Applied Mathematics, vol. 278, Chapman & Hall/CRC, 2006.
2. F. Halter-Koch, *Quadratic Irrationals*, Pure and Applied Mathematics, vol. 306, Chapman & Hall/CRC, 2013.