

WITT FUNCTOR OF RING NORMALIZATION

Przemysław Koprowski
(University of Silesia, Katowice)

Witt ring of similarity classes of finitely generated projective modules equipped with non-degenerate bilinear forms over a given base ring is an important ring invariant. Assigning the Witt ring WP to a given ring (commutative with unity) P constitutes a covariant functor from the category of commutative rings to itself.

In this talk we will discuss the behavior of this functor on a natural injection $P \hookrightarrow R$, where P is a Noetherian domain of dimension one and R is the normalization (resp. subextension of the normalization) of P . It is somehow tempting to expect that P , not being normal, may admit some forms that are not metabolic only because P “misses” some elements. These forms then become metabolic in the integral closure of P . Consequently, in general, $W(P \hookrightarrow R)$ “should” not be a monomorphism.

During the talk we will see that $W(P \hookrightarrow R)$ is indeed non-injective providing that P is semi-normal and not quadratically closed in R . We shall present also a more general local sufficient condition for $W(P \hookrightarrow R)$ not to be a monomorphism. We will shortly comment on the proof strategy which includes a generalization of Schralau’s transfer to a case of a local quadratic extension where the overring is not free over the base ring. This generalization is of a certain interest by itself. Finally, we discuss how the non-injectivity of $W(P \hookrightarrow R)$ can be inferred from existence of a certain elements in the kernel of $\text{Pic}(P \hookrightarrow R)$ the Picard functor of the normalization of P .