Factoring formal power series over principal ideal domains

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We provide an irreducibility test and factoring algorithm (with some qualifications) for formal power series in the unique factorization domain $R[[X]]$, where R is any principal ideal domain. We also classify all integral domains arising as quotient rings of $R[[X]]$. Our main tool is a generalization of the p-adic Weierstrass preparation theorem to the context of complete filtered commutative rings.

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