DERIVED F-ZIPS

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The theory of F-zips is a positive characteristic analog of the theory of integral Hodge-structures. As shown by Moonen and Wedhorn, one can associate to any proper smooth scheme with degenerating Hodge-de Rham spectral sequence and finite locally free Hodge cohomologies an F-zips, via its n-th de Rham cohomology.

Using the theory of derived algebraic geometry, we can work with the de Rham hypercohomology and show that it has a derived analog of an F-zip structure. We call these structures *derived F-zips*. We can attach to any proper smooth morphism a derived F-zip and analyze families of proper smooth morphisms via their underlying derived F-zip. As an example, we will apply this to the moduli stack of Enriques surfaces, which was not possible with the classical theory of F-zips.