

**Alonso Tarrío, Leovigildo; Jeremías López, Ana; Lipman, Joseph**

**Duality and flat base change on formal schemes.** (English) [Zbl 0953.14011](#)

Alonso Tarrío, Leovigildo et al., Studies in duality on noetherian formal schemes and non-noetherian ordinary schemes. Providence, RI: American Mathematical Society. Contemp. Math. 244, 3-90 (1999).

This is the first of a series of three independent (but related) papers in the same volume of Contemporary Mathematics. It deals with a very general Grothendieck duality theorem for unbounded complexes on noetherian formal schemes. This theorem synthesizes several duality results such as local duality, formal duality, dualizing complexes, and residue theorems. The approach consists in a non-trivial adaptation of a method of *P. Deligne* [in: Sémin. Géométrie algébrique, Bois-Marie 1963/64 SGA4, Tome 3, expose' XVII, Lect. Notes Math. 305, Springer-Verlag, New York, 250-480 (1973; [Zbl 0255.14011](#))]. One of the main technical difficulties is that, unlike in the category of algebraic varieties, at present one lacks a Nagata-type compactification result for morphisms in the formal category. A flat base-change theorem for pseudo-formal morphisms leads to sheafified versions of duality for bounded-below complexes with quasi-coherent homology. Thanks to Greenlees-May duality, the results obtained take a specially nice form for proper morphisms and bounded-below complexes with coherent homology.

For the entire collection see [[Zbl 0927.00024](#)].

Reviewer: [Lucian Bădescu \(București\)](#)

**MSC:**

- [14F99](#) (Co)homology theory in algebraic geometry
- [32C37](#) Duality theorems for analytic spaces
- [14B15](#) Local cohomology and algebraic geometry
- [13D99](#) Homological methods in commutative ring theory
- [14A10](#) Varieties and morphisms
- [32A27](#) Residues for several complex variables

Cited in **2** Reviews  
Cited in **11** Documents

**Keywords:**

formal schemes; duality; base change; derived categories; Grothendieck duality theorem; dualizing complexes; residue theorems; Greenlees-May duality