

This note, that [was found here](#), as a part of [a collection](#) is written (completely with human hands) by [Rupadarshi Ray](#), was created on June 30, 2024 1:30:53 PM, was last modified on May 17, 2026 7:36:52 PM, and was exported on September 7, 2026 3:31:13 PM.

Three different relative chain complexes of differential forms

A smooth map between manifolds

$$f : S \rightarrow M$$

gives a algebra morphism

$$f^* : \Omega^\bullet(M) \rightarrow \Omega^\bullet(S)$$

	$f : S \rightarrow M$	cohomology	of submanifolds $\iota_N : N \leq M$	sheaf
relative to a smooth map	Definition. D Let $f : S \rightarrow M$ be a smooth map between smooth manifolds. Then $(\Omega^\bullet[f], d)$ $\Omega^\bullet[f] := \bigoplus$ $\Omega^k[f] := \Omega^k(S)$ $d(\omega, \theta) := (d\omega,$ is the cocomplex of differential forms relative to the map f.	consists of closed forms on M that become exact when pulled back by f	Chain complex of differential forms relative to a submanifold	
kernel	$f : S \rightarrow M$ $\ker f^*$		subalgebra+subcomplex of forms which is 0 when restricted to a submanifold which is the kernel of $\Omega^\bullet(M; N) := \ker$	
cokernel	$\Omega^\bullet(f : S/M) :=$		$\Omega^\bullet(N/M) := \frac{\Omega}{\iota_N^* \Omega}$	



$$H^* \Omega^\bullet(M; N) \cong H^* \Omega^\bullet[\iota_N]$$

[1]

Current note has 2 direct children and 2 total descendants.

- [structures based on sets](#)
 - [manifolds](#)
 - [smooth \$\mathbb{R}\$ -manifold](#)
 - [Tangents on a smooth manifold](#)
 - [Differential forms on smooth manifolds](#)
 - [Three different relative chain complexes of differential forms](#)
 - [Differential forms relative to a smooth map](#)
 - [Chain complex of differential forms relative to a submanifold](#)

And it has 7 siblings.

- [structures based on sets](#)
 - [manifolds](#)
 - [smooth \$\mathbb{R}\$ -manifold](#)
 - [Tangents on a smooth manifold](#)
 - [Differential forms on smooth manifolds](#)

--	--	--	--	--	--

- [Differential 1-forms on smooth manifolds](#)
- [Chain complex of differential forms on a smooth manifold](#)
- [Exterior derivative operator on space of smooth differential forms](#)
- [Functoriality of \$\mathcal{F}^k\$ on smooth manifolds](#)
- [The integral map on space of differential forms](#)
- [Three different relative chain complexes of differential forms](#)
- [The sheaf of differential forms on open subsets of manifolds](#)

1. Johannes Ebert (<https://mathoverflow.net/users/9928/johannes-ebert>), Relative De Rham cohomologies, URL (version: 2012-10-30): <https://mathoverflow.net/q/111063> ↩