Theorem 1. The core $A = C^{\geqslant 0} \cap C^{\leqslant 0} \subset C$ is an abelian category.

Definition 2 (cohomology object). The *i*-th cohomology object of $X \in \mathcal{C}$ is defined as

$$H^0(X) = \tau_{[0,0]}(X) \in \mathcal{A},$$

$$H^i(X) = H^0(X[i]) \in \mathcal{A}.$$

Definition 3 (nondegenerate t-structure). A t-structure on \mathcal{C} is nondegenerate $if \cap_n \mathrm{Ob} \, \mathcal{C}^{\geqslant n} = \bigcap_n \mathrm{Ob} \, \mathcal{C}^{\leqslant n} = \{0\}.$

Theorem 4. H^0 is a cohomological functor.

If additionally the t-structure is nondegenerate, then

- $f: X \to Y$ in C is an isomorphism iff $\forall_i H^i(f)$ is an isomorphism,
- $\operatorname{Ob}(\mathcal{C}^{\leq n}) = \{ X \in \operatorname{Ob} \mathcal{C} : \forall_{i > n} H^i(X) = 0 \},$
- $\operatorname{Ob}(\mathcal{C}^{\geqslant n}) = \{ X \in \operatorname{Ob} \mathcal{C} : \forall_{i < n} H^i(X) = 0 \}.$

Definition 5 (bounded t-structure). A t-structure is bounded if it is nondegenerate and for any $X \in \mathcal{C}$, $H^i(X) \neq 0$ only for a finite number of i.

Definition 6 (Ext). $\operatorname{Ext}_{\mathcal{C}}^{i}(X,Y) = \operatorname{Hom}_{\mathcal{C}}(X,Y[i])$

Definition 7 (multiplication on Ext). Notice that $\operatorname{Hom}_{\mathcal{C}}(X,Y[i]) = \operatorname{Hom}_{\mathcal{C}}(X[k],Y[i+k])$ and define multiplication $\operatorname{Ext}_{\mathcal{C}}^i(X,Y) \times \operatorname{Ext}_{\mathcal{C}}^j(Y,Z) \to \operatorname{Ext}_{\mathcal{C}}^{i+j}(X,Z)$ in the most obvious way.

Theorem 8. Let \mathcal{A} be a core of a bounded t-structure on \mathcal{C} . Assume $F: D^b(\mathcal{A}) \to \mathcal{C}$ satisfies

$$F(D^b(\mathcal{A})^{\geqslant 0}) \subset \mathcal{C}^{\geqslant 0},$$

$$F(D^b(\mathcal{A})^{\leqslant 0}) \subset \mathcal{C}^{\leqslant 0},$$

then F is an equivalence of categories iff $\operatorname{Ext}_{\mathcal{C}}$ is generated by $\operatorname{Ext}_{\mathcal{C}}^1$ under Yoneda multiplication.

Remark 9. In chain complexes $\operatorname{Ext}^i_{\mathcal{C}}(X,Y):0\to Y\to E_i\stackrel{d^i}{\longrightarrow}\dots\stackrel{d^2}{\longrightarrow}E_1\stackrel{d^1}{\longrightarrow}X\to 0.$

Theorem 10. Assume that C satisfies additionally:

- TR5. Arbitrary coproducts and products exist in C.
- There is a generating set Λ of objects in C, i.e. set Λ such that
 - $-T(\Lambda) \subset \Lambda$, T translation functor,
 - $-if X \in \mathcal{C} \text{ and } \forall_{\lambda \in \Lambda} \operatorname{Hom}(\lambda, X) = 0, \text{ then } X \simeq 0.$

Then any homological functor $H: \mathcal{C} \to \mathcal{A}$ (where \mathcal{A} is abelian) which sends coproducts to products is representable, i.e. $H = \mathcal{C}(\cdot, h)$.