Theorem 1. *The core* $\mathcal{A} = \mathcal{C}^{\geqslant 0} \cap \mathcal{C}^{\leqslant 0} \subset \mathcal{C}$ *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* $\bigcap_n \operatorname{Ob} \mathcal{C}^{\geqslant n} = \bigcap_n \operatorname{Ob} \mathcal{C}^{\leqslant n} = \{0\}$.

Theorem 4. H^0 *is a cohomological functor.*

If additionally the t-structure is nondegenerate, then

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

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

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* $\operatorname{Ext}^i_{\mathcal{C}}(X, Y) \times \operatorname{Ext}^j_{\mathcal{C}}(Y, Z) \to \operatorname{Ext}^{i+j}_{\mathcal{C}}(X, Z)$ *in the most obvious way.*

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

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

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

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

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

Theorem 10. *Assume that* $\mathcal{C}$ *satisfies additionally:*

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