

The goal of this work was to prove the fact, that definable closure of any subclass of cotorsion modules closed under direct sums consists of  $\Sigma$ -cotorsion modules. The only known proof uses substantially the calculus of derived category, in this work we tried to prove the same, but only by means of a given category of all right  $R$ -modules and set-theoretic properties of partial orders indexing direct systems of  $R$ -modules. The main results of this work are proved under additional assumptions on the ring  $R$ , in particular  $\text{card } R \leq \aleph_{\omega}$  or  $\text{dim}(R) < \aleph_{\omega}$ . Attempts to give a proof in the same general situation, where the fact is known to hold, was not successful.