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Draft
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1 Preliminaries (to do work)

The contents of this chapter are based on [1] and [2].

Definition 1.1 (Persistance module)**.**

Definition 1.2 (Barcode)**.**

Definition 1.3 (δ-interleaving)**.**

Definition 1.4 (Interleaving distance)**.**

Definition 1.5 (δ-matching)**.**

Definition 1.6 (Bottleneck distance)**.**

2 Structure Theorem

Theorem 2.1 (Structure)**.** *Let (V, π) be a persistence module.*

$$(V, \pi) \equiv \bigoplus_{i=1}^{N} \mathbb{F}(I_i, c_i)^{m_i}$$

3 Stability Theorem

Lemma 3.1.

Theorem 3.1 (Stability)**.** *Given two persistence modules (V, π), (W, ϕ), we have*

$$d_{int}((V, \pi), (W, \phi)) = d_{bot}(\mathrm{bar}(V, \pi), \mathrm{bar}(W, \phi)).$$

References

[1] V. Nanda, "Computational algebraic topology, lecture notes," 2020.

[2] L. Polterovich, D. Rosen, K. Samvelyan, and J. Zhang, *Topological Persistence in Geometry and Analysis*. American Mathematical Society, 2020.