

THE THOM ISOMORPHISM

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ABSTRACT. Script for a talk of the Wednesday Seminar of the GK1821 at Freiburg during the Summer Semester 2021. The main reference is [Ati67, §2].

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—parts in gray will be omitted during the talk—

1. SETTING AND CONVENTIONS

- We work with complex vector spaces and complex vector bundles only.
- We use the usual word *rank* instead of *dimension*, which is the one used in [Ati67].

2. REMARKS ON PRELIMINARIES FROM [Ati67]

2.1. Basic definitions [Ati67, §1.1].

Remark 1 ([Ati67, p. 1]). Even if “the topology on E_x ” didn’t mean the euclidean topology—which it probably does—, continuity of scalar multiplication still imposes restrictions on the topology of E . For instance, E cannot be a discrete topological space unless all the fibres of p are zero-dimensional.

Remark 2 ([Ati67, p. 2]). If φ is a homomorphism of families which is bijective and such that φ^{-1} is continuous, then φ^{-1} is indeed again a homomorphism of families, because the inverse of a bijective linear homomorphism is again a linear homomorphism.

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Remark 3 ([Ati67, pp. 4–5]). As suggested by Atiyah, everything said in this pages becomes easier to see if we fix bases of the (finite dimensional) vector spaces involved. Linear homomorphisms are then given by matrices, and two matrices are close to each other if their entries are close to each other in the euclidean sense.

REFERENCES

- [Ati67] M. F. Atiyah. *K-theory*. Lecture notes by D. W. Anderson. W. A. Benjamin, Inc., New York-Amsterdam, 1967.

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