



Exercises to the lecture ‘K-Theory of C^* -algebras’
Winter term 2019/2020

Sheet 2

to be discussed: Monday, 18 + 25 Nov + 2 Dec, 10:15, lecture hall HS IV

The aim is to understand AF-algebras. The source is Ch. III+IV, *C^* -algebras by example*, Ken Davidson, Fields Institute Monographs, 1996. You may also take a look at *K-Theory for operator algebras*, Bruce Blackadar, Springer, 1986.

Exercise 1. Bratteli-diagrams (Ch. III.1, III.2): finite dimensional C^* -algebras as direct sums of matrix algebras and the role of their matrix units $(E_{ij}^{(k)})$ with $E_{ij}^{(k)} E_{st}^{(l)} = \delta_{kl} \delta_{js} E_{it}^{(k)}$ and $(E_{ij}^{(k)})^* = E_{ji}^{(k)}$, in particular Cor. III.2.2; Def. Bratteli-diagram; examples; Prop. III.2.7 with (sketched) proof.

Exercise 2. Ideals and quotients in AF-algebras: Ch. III.4 and III.5 (sketched proof of Thm. III.4.2)

Exercise 3. Local characterization of AF-algebras and short exact sequences Ch III.3+III.6: Thm. III.3.4, vague idea of the proof, Thm. III.6.3 (vague idea of proof)

Exercise 4. K_0 of stably finite C^* -algebras: IV.1 (mainly IV.1.6) and IV.2

Exercise 5. Dimension groups and a bit of Riesz groups: IV.3 and a bit of IV.6 + IV.7 (mainly IV.3.3; summarize a bit IV.6.1 + IV.6.4; mention briefly IV.7.2 + IV.7.3)

Exercise 6. Elliott’s classification theorem of AF algebras: IV.4 (Thm. IV.4.3); mention a bit from IV.5 (summarize IV.5.1 + IV.5.2 + IV.5.3)