

The Mini-course on

Operator Algebras and its Application, February 3-4, 2018

School of Mathematics, IPM, Tehran

Reduced Cohomology

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We discuss Kazhdan property (T) of locally compact groups and show that these groups are compactly generated (finitely generated, if discrete). We also discuss property (FH) (any continuous action by affine isometries has a fixed point) and show that it is the same as vanishing of the first cohomology space of each representation.

We show that property (FH) implies property (FA) of Serre. We also give the idea of Delorme- Guichardet theorem: for σ -compact locally compact groups, properties (T) and (FH) are equivalent.

We introduce the notion, and discuss the properties of the reduced cohomology and give the idea of the Shalom's theorem, which in particular, implies that a countable group with property (T) is the quotient of a finitely presented group with property (T). If time allows, we allude to the Kostant's example of the isometry group of a quaternionic hyperbolic space.

Reference

B. Bekka, P. de la Harpe, and A. Valette, *Kazhdan's Property (T)*, Cambridge University Press, 2008.