Bratteli, Ola

Derivations, dissipations and group actions on C^*-algebras. (English) Zbl 0607.46035
Lecture Notes in Mathematics, 1229. Berlin etc.: Springer-Verlag. VI, 277 p. DM 42.50 (1986).

Let G be a Lie group acting on a C^*-algebra A. Let A_n, A_F be the subalgebras of n times G-differentiable and of G-finite elements respectively. The book under review is mainly concerned with the following two questions:

1. When does every *-derivation δ from A_n or A_F into A have a decomposition $\delta = a_1\delta_1+a_2\delta_2+...+a_k\delta_k+\tilde{\delta}$ where $\delta_1, ..., \delta_k$ is a basis for the Lie algebra of G, $a_1, ..., a_k$ are real functions on Prim A and $\tilde{\delta}$ is approximately inner or bounded ?

2. Are all *-derivations from A_F to A_F, or from A_∞ to A_1 pregenerators ? (δ is a pregenerator if its closure generates a one-parameter automorphism group).

The author assembles a large number of positive results in special cases (e.g. A commutative or G compact +*additional* conditions) due to various authors. He also discusses the question of when a derivation that commutes with the action of G is a generator and studies analogs of the 2 questions above for dissipations in the place of derivations.

The book is very complete and gives a state of the art account of this subject which has been investigated by a fair number of mathematicians and is still under active research.

Reviewer: J.Cuntz

MSC:

46L55	Noncommutative dynamical systems
47B47	Commutators, derivations, elementary operators, etc.
46-02	Research exposition (monographs, survey articles) pertaining to functional analysis
47B44	Linear accretive operators, dissipative operators, etc.

Keywords:

Lie group acting on a C^*-algebra; *-derivation; Lie algebra; approximately inner; pregenerators; dissipations