WEAK (F)-AMENABILITY OF R(X)

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1. INTRODUCTION

In this paper we shall discuss the amenability and weak amenability of certain commutative Banach algebras. We begin by recalling the basic definitions.

1.1 DEFINITION Let A be an algebra, and let X be an A-bimodule. Then X is *commutative* if

$$a.x = x.a \qquad (a \in A,\ x \in X).$$

If A is commutative, then an A-*module* is a commutative A-bimodule.

Note that an algebra A is always itself an A-bimodule, with module operations given by multiplication in A.

1.2 DEFINITION Let A be a Banach algebra. A *Banach* A-*bimodule* is an A-bimodule X, equipped with a complete norm $\|\cdot\|$, satisfying

$$\|a.x\| \le \|a\|\|x\|,\ \|x.a\| \le \|a\|\|x\| \qquad (a \in A,\ x \in X).$$

If A is commutative, then a *Banach* A-*module* is a commutative Banach A-bimodule.

1.3 DEFINITION Let A be an algebra. A *derivation* from A into an