

NON-COMMUTATIVE DISINTEGRATIONS AND REGULAR CONDITIONAL PROBABILITIES

ARTHUR PARZYGNAT

Classical regular conditional probabilities and disintegrations can be formulated diagrammatically in a category of stochastic maps. Combining this with the functor taking stochastic maps to positive maps on C^* -algebras, the notion of non-commutative disintegration and regular conditional probability can be extended to states on C^* -algebras. Unlike the classical case, the existence of non-commutative disintegrations is not guaranteed even on finite-dimensional matrix algebras. We will state some general existence and uniqueness results as well as examples. This is joint work with Benjamin P. Russo (Farmingdale State College SUNY).