Boundary quotient C*-algebras for product systems

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A boundary quotient is a terminal object for a class of representations. In most of the cases boundary quotients are manifestations of corona sets and they are indispensable for our understanding beyond the "classical" universe of finite dimensional algebras and their norm-limits.

C*-terminal objects are central elements of the theory, while they provide key C*-constructs in the study of geometric and topological objects. This interplay goes as back as the classification of factors by Murray and von Neumann in the 1930's, and has been a continuous source of inspiration for further developments. Applications include for example detecting phase transitions of C*-invariants.

On the other hand the Shilov and the Choquet boundaries of (nonselfadjoint) function algebras have been the subject of intense research since the 1950's providing fruitful interactions with convexity and approximation theory. Their noncommutative analogues have been a groundbreaking foresight of Arveson's seminal work in the 1960's, and beyond. Applications include interactions with group theory, noncommutative geometry, and noncommutative convexity, to mention only but a few.

In this talk we will show how a combination of the selfadjoint and the nonselfadjoint viewpoints gives the existence of the boundary quotient C*-algebra for product systems. This class has been under consideration for the past 30 years and models a great number of C*-constructs, including graphs (of rank 1 or higher), C*-dynamics of several flavors (reversible and irreversible), semigroup C*-algebras, and Nica covariant representations of compactly aligned product systems.

The talk is based on joint works with Dor-On, Katsoulis, Laca and Li.