We consider theories of exponential topological fields of characteristic 0 equipped with an exponential derivation that does not interact with the topology.

The notion of exponential algebraicity introduced by A.Macintyre in the 80s is more complex than the notion of algebraicity. This notion has been characterized by J.Kirby using formal exponential derivations. We rely on this characterization to extend an exponential derivation on an exponential field extension. Given an exponential field K and a regular variety V defined over K and corresponding to zeros of exponential polynomials, we construct an elementary extension L of K, and generic points of V in L.

Then, starting from a model-complete theory of topological exponential fields where either an implicit function theorem or a largeness property holds, we show that differential expansions of models that are existentially closed satisfy a differential lifting scheme. In such models the differential subfield of constants is dense. This differential lifting scheme is in the spirit of the geometrical axiomatization given by D.Pierce and A.Pillay of the differentially closed fields of characteristic 0.

A.Wilkie has shown model-completeness of the theory of the ordered field of real numbers with the exponential function, while N.Mariaule has shown model-completeness of the theory of the complex p-adic numbers with the p-adic exponential function on the valuation ring. Our results apply to differential expansions of models of these two theories.

Independently, we show some versions of strong, weak Nullstellensätze for partial exponential fields, as well as a real Nullstellensatz for ordered partial exponential fields.