

Abstract

We study supergravity solutions of type II branes wrapping a Melvin universe. These solutions provide the gravity description of non-commutative field theories with non-constant non-commutativity parameter. Typically these theories are non-supersymmetric, though they exhibit some feature of their corresponding supersymmetric theories. An interesting feature of these non-commutative gauge theories is that there is a critical length in the theory in which for distances larger than this length the effects of non-commutativity become

important and for smaller distances these effects are negligible. Therefore we would expect to see this kind of non-commutativity in large distances which might be relevant in cosmology.

We also study M5-brane wrapping on 11-dimensional Melvin universe and its descendant theories upon compactifying on a circle.