

Non-commutative soliton scattering

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The Moyal-plane is one of the simplest examples of a non-commutative space. The non-commutativity can be realized by generalizing the product of two functions. This new multiplication rule is non-commutative but associative. The ordinary product is recovered when the non-commutativity parameter of the space, θ , is zero. Static solitonic solutions of the equation of motion for a scalar field theory exist for large values of θ . In a moduli space approximation one finds that solitons scatter under 90 degree angle when they collide head-on. This conclusion is verified with numerical calculations for large θ and also found to be true at smaller values of θ it is shown that is even true for small values of θ .