Contribution ID: **55** Type: **Talk**

A proposal of quantization with a minimal length present

Sunday 10 May 2015 10:40 (40 minutes)

The proposal consists of extending the 4-dimensional physical space to an 8-dimensional pseudo-complex (pc) space. The pc-extension introduces a minimal length as a parameter, thus, it is unaffected by Poincaré transformations. All continuous symmetries are maintained. In the extended space, standard quantization rules are applied and it is shown that after projection to the 4-dimensional physical space it is equivalent to non-commuting coordinates and non-commuting linear moments. A simple (1+1)-dimensional model is discussed investigating remnant effects of the 4-dimensional (in pc-coordinates) origin. The main result is: Extending to a higher dimensional space might offer to maintain the standard quantization rules and continuous symmetries, but at the same time simulating the effects of a minimal length and non-commutative properties of coordinates.

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Track Classification: SMFNS2015