

Institut Ruđer Bošković
ZAVOD ZA TEORIJSKU FIZIKU
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SEMINAR ZAVODA ZA TEORIJSKU FIZIKU
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Zavoda za eksperimentalnu fiziku IRB-a i Fizičkog odsjeka PMF-a)

IceCube and GRB neutrinos propagating in quantum spacetime

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Abstract:

Some recent publications have reported intriguing analyses, tentatively suggesting that some aspects of IceCube data might be manifestations of quantum-gravity-modified laws of propagation for neutrinos. I will show a strategy of data analysis which has the advantage of being applicable to several alternative possibilities for the laws of propagation of neutrinos in a quantum spacetime. In all scenarios here of interest one should find a correlation between the energy of an observed neutrino and the difference between the time of observation of that neutrino and the trigger time of a GRB. I'll show how to select accordingly some GRB-neutrino candidates among IceCube events, and the data analysis finds a rather strong such correlation. This sort of studies naturally lends itself to the introduction of a "false alarm probability", which for this analysis can be estimate conservatively to be of 1should however motivate a vigorous program of investigation following the strategy that I will discuss in detail in this talk

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