A SIMPLE PROOF OF THE CLASSIFICATION THEOREM FOR POSITIVE NATURAL PRODUCTS

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Abstract: A simplification of the proof of the classification theorem for natural notions of stochastic independence is given. This simplification is made possible after adding the positivity condition to the algebraic axioms for a (non-symmetric) universal product (i.e. a natural product). Indeed, this simplification is nothing but a simplification, under the positivity, of the proof of the claim that, for any natural product, the 'wrong-ordered' coefficients all vanish in the expansion form. The known proof of this claim involves a cumbersome process of solving a system of quadratic equations in 102 unknowns, but in our new proof under the positivity we can avoid such a process.

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