

# On the structure and probabilistic interpretation of Askey-Wilson densities and polynomials with complex parameters

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We give equivalent forms of Askey-Wilson (AW) polynomials expressing them with a help of Al-Salam-Chihara polynomials. After restricting parameters of AW polynomials to complex conjugate pairs we give probabilistic interpretation of AW weight function and expand it in the series similar to Poisson-Mehler expansion formula and give its probabilistic interpretation. On the way (by setting certain parameter  $q$  to to 0) we get some formulae useful in rapidly developing so called 'free probability'.

Subjects: **Classical Analysis and ODEs (math.CA)**; Probability (math.PR)

MSC classes: Primary 33D45, 62H05, Secondary 60E05

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