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# Tail Asymptotic of Sum and Product of Random Variables with Applications in the Theory of Extremes of Conditionally Gaussian Processes

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We consider two independent random variables with the given tail asymptotic (e.g. power or exponential). We find tail asymptotic for their sum and product. This is done by some cumbersome but purely technical computations and requires the use of the Laplace method for asymptotic of integrals. We also recall the results for asymptotic of a self-similar locally stationary centered Gaussian process plus a deterministic drift; and we find the asymptotic for the same probability after multiplying the drift by a random variable, which is independent of this process.

Keywords: tail asymptotic, Laplace method, self-similar processes, Gaussian processes, locally stationary processes.

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

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