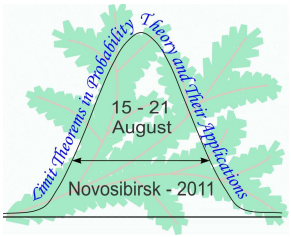

Properties of renewal function density for smooth absolutely continuous distributions[1]

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In [1] and [2] there are described the properties of renewal function increments for distributions with regularly varying tails and infinite mean. If the initial distribution has a regularly varying tails with $\alpha \in (0, 1/2]$ the increments is not regularly varying in general case. It is possible to obtain only regularly varying lower bound for the increments. In [2] there are proposed hypotheses (without proofs) when the increments will be regularly varying. In [3] there are proposed conditions and there are obtained precise asymptotic of the renewal function density as $\alpha \in (0, 1/2]$, and in [4] under additional conditions there are proved regularly varying of the renewal function density derivative. All these conditions there are presented in the hypotheses from [2].

We propose conditions, when renewal function density and its derivative will be regularly varying if $\alpha \in (1/2, 1]$.

[1] K.B. Erickson, *Strong renewal theorems with infinite mean*, Transactions of the American mathematical society, **151** (1970), 263–291.

[2] K.B. Erickson, *A renewal theorem for distribution on* $\mathbb{R}^1$ *without expectation*, Buletin Amer. Math. Society, **77** (1971), 406–410.

[3] V. Topchii, *Renewal measure density for distributions with regularly varying tails of order* $\alpha \in (0, 1/2]$, In: Workshop on Branching Processes and Their Applications: Lecture Notes in Statistics, **197** (2010), Eds. González Velasco M., del Puerto I. M., Martínez. R., Molina M., Mota M., Ramos A. Berlin: Springer 109–118.

[4] V. Topchii, *The derivative of renewal measure density with infinite mean*, Siberian Electronic Mathematical Reports, **7** (2010), 340-349.

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