PROBLEMS

Let a random flight in R^n (generalization of Goldstein-Kac model) has on of the following matrices for one step transition probabilities of swiching Markov process:

$$P = \begin{pmatrix} 0 & 1 & 0 & \dots \\ 0 & 0 & 1 & \dots \\ 0 & 0 & 0 & \dots \\ \dots & \dots & \dots & \dots \\ 1 & 0 & 0 & \dots \end{pmatrix}$$

the case of cyclic change of directions,

$$P = \begin{pmatrix} 0 & \frac{1}{n} & \frac{1}{n} & \dots \\ \frac{1}{n} & 0 & \frac{1}{n} & \dots \\ \frac{1}{n} & \frac{1}{n} & 0 & \dots \\ \dots & \dots & \dots & \dots \end{pmatrix}$$

the case of uniform change of directions.

Define corresponding transition probability matrices $P(t)$, projectors Π and potentials R_0.

Use the notion of hyperbolic function

$$ch_{n,0}x = \frac{1}{n}(e^x + e^{(\cos\frac{2\pi}{n} + i\sin\frac{2\pi}{n})x} + \ldots + e^{(\cos\frac{2(n-1)\pi}{n} + i\sin\frac{2(n-1)\pi}{n})x}), \qquad (*)$$

$$ch_{n,i}x := (ch_{n,0}x)^{(i)}, i = \overline{1, n-1}.$$