totic formula (3.2), we obtain

$$1 - p_s \sim s^\alpha a \int_0^\infty dx \, \frac{1 - e^{-x}}{x^{1+\alpha}} \tag{4.6}$$

as $s \to 0$. An integration by parts together with the integral representation of the gamma function [21], $\Gamma(x) = \int_0^\infty dy \, e^{-y} y^{x-1}$, reduces (4.6) to the form

$$1 - p_s \sim \frac{a\Gamma(1-\alpha)}{\alpha} \, s^\alpha. \tag{4.7}$$

Now, using this result and the Laplace transforms

$$\langle Y_t \rangle_s = l \, \frac{p_s}{s(1-p_s)}, \qquad \langle Y_t^2 \rangle_s = l^2 \frac{p_s^2 + p_s}{s(1-p_s)^2} \tag{4.8}$$

of the first two moments of Y_t, we find in the limit $s \to 0$:

$$\langle Y_t \rangle_s \sim \frac{l\alpha}{a\Gamma(1-\alpha)} \, \frac{1}{s^{1+\alpha}} \tag{4.9}$$

and

$$\langle Y_t^2 \rangle_s \sim \frac{2l^2\alpha^2}{a^2\Gamma^2(1-\alpha)} \, \frac{1}{s^{1+2\alpha}}. \tag{4.10}$$

Since these asymptotic formulas are particular cases of the asymptotic formula (4.1) in which the slowly varying function $L(1/s)$ is a constant, from (4.2) we obtain in the long-time limit

$$\langle Y_t \rangle \sim \frac{l\alpha}{a\Gamma(1-\alpha)\Gamma(1+\alpha)} \, t^\alpha \tag{4.11}$$

and

$$\langle Y_t^2 \rangle \sim \frac{2l^2\alpha^2}{a^2\Gamma^2(1-\alpha)\Gamma(1+2\alpha)} \, t^{2\alpha}. \tag{4.12}$$

Thus, in this case $\lim_{t\to\infty} \langle Y_t \rangle^2 / \langle Y_t^2 \rangle \neq 1$ and the above asymptotic expressions yield

$$\sigma^2(t) \sim \frac{l^2\alpha^2}{a^2\Gamma^2(1-\alpha)} \left(\frac{2}{\Gamma(1+2\alpha)} - \frac{1}{\Gamma^2(1+\alpha)} \right) t^{2\alpha}. \tag{4.13}$$

According to this result, which agrees with that obtained in the context of the asymptotic solution of the CTRW [20], subdiffusion occurs if $\alpha \in (0, 1/2)$ and superdiffusion if $\alpha \in (1/2, 1)$. If $\alpha = 1/2$ then $\sigma^2(t) \propto t$ and, in accordance with the commonly used terminology, the biased diffusion is normal. However, for normal diffusion processes both the mean and variance are proportional to time. Therefore, since $\langle Y_t \rangle \propto t^{1/2}$ at $\alpha = 1/2$, this type of diffusion should be more appropriately termed as quasi-normal. It is also worthy to note that, according to Eqs. (3.6) and (4.13), the larger is the particle mass, the stronger is diffusion.