

$$\begin{array}{l} f\text{Lipschitz}\\ K>0\\ |f(x)-f(y)|\leq K|x-y|. \end{array}$$

$$\begin{array}{l} f\\ K>0\\ |f(x)|\leq K(1+|x|). \end{array}$$

$$\begin{array}{l} p\geq 1\\ E[Y_T^{(p)}]<\infty\\ Y_t^{(p)}:=1+\sup_{0\leq r\leq t}|X_r|^p\\ S_\ell:=\inf\{t\geq 0:Y_t^{(p)}>\ell\}\\ \ell\in\mathbb{N}\\ X\geq t\\ 0Y_t^{(p)}<\infty\\ \ell\rightarrow\infty\\ S_\ell\uparrow\infty\\ P_D\\ t\mapsto E_B[Y_{t\wedge S_\ell}^{(p)}]\\ \ell\\ t=T\\ \ell\rightarrow\infty\\ E_B[Y_T^{(p)}]\\ S_\ell\\ \int_0^tE_B[Y_{r\wedge S_\ell}^{(p)}]dE_r\leq \ell E_t<\infty, \end{array}$$

$$\begin{array}{l} p\geq 2\\ 1\leq p\leq 2\\ p\geq 2\\ 2\\ X^p_s=\\ x_0^p+\\ J^p_s+\\ K_s \end{array}$$

$$J_s:=\int_0^s\sigma pX_r^{p-1}\,dB_{E_r};$$

$$K_s:=\int_0^s\left\{pX_r^{p-1}f(X_r)+\frac{\sigma^2}{2}p(p-1)X_r^{p-2}\right\}\,dE_r.$$

$$\begin{array}{l} t\in [0,T] \\ \ell\in \mathbb{N} \\ (x+y+z)^p\leq c_p(x^p+y^p+z^p) \\ x,y,z\geq 0 \\ c_p=3^{p-1} \end{array}$$

$$E_B\left[\sup_{0\leq s\leq t\wedge S_\ell}|K_s|\right]\leq \left(p c_p K+\frac{1}{2}p(p-1)c_p K^2\right)\int_0^{t\wedge S_\ell}E_B[Y_r^{(p)}]\,dE_r.$$

$$\begin{array}{l} (J_s)_{s\geq 0}\\ E_B\left[\sup_{0\leq s\leq t\wedge S_\ell}|J_s|\right]\leq b_1E_B\left[\left(\int_0^{t\wedge S_\ell}\sigma^2p^2X_r^{2p-2}\,dE_r\right)^{1/2}\right], \end{array}$$