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$t \geq 3\hat{t} := t^*$, existen un entero positivo K_t y un número real $t_0 \in [\hat{t}, 2\hat{t}]$ tales que $t = K_t N_1 T + t_0$.

Para $h \in \mathcal{D}$, obtenemos por la $T-$ periodicidad de f y A que:

$$S(w_0 + h)(t) - S(w_0)(t) = S(S(w_0 + h)(K_t N_1 T))(t_0) - S(S(w_0)(K_t N_1 t))(t_0).$$

Ahora bien, sea $\beta > \frac{1}{2}$, puesto que $\|S(w_0)(t)\|_0$ y $\|S(w_0 + h)(t)\|_0$ son acotadas, por el Lema 3.2, obtenemos que para $\|h\|_\alpha \leq R$, y para todo $t_0 \in [\hat{t}, 2\hat{t}]$:

$$\|S(S(w_0 + h)(K_t N_1 T))(t_0) - S(S(w_0)(K_t N_1 T))(t_0)\|_\beta$$

$$\leq C(\beta, \sigma)(t_0)^{-\sigma} \|S(w_0 + h)(K_t N_1 T) - S(w_0)(K_t N_1 T)\|_0$$

$$\leq C(\beta, \sigma)(N_1 T)^{-\sigma} e^{-\gamma^* K_t N_1 T} \|h\|_\alpha \leq C e^{-\gamma^* t},$$

donde $\beta - \alpha < \sigma < 1$.

El resultado se sigue finalmente, de la inclusión $\mathbb{X}_\beta \subseteq C^{1+\lambda}(\bar{\Omega})$, para $0 < \lambda < 2\beta - 1 - n/p$. ■

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