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So that

$$\left| \int_0^{2\pi} f(t)\, \Lambda_n(t-x)\, dt \right| = \left| \int_0^{2\pi} f'(t)\, \overline{\Lambda}_n(t-x)\, dt \right| \leqq \int_0^{2\pi} |\overline{\Lambda}_n(t)|\, dt$$

$$\text{with } \overline{\Lambda}_n(t) = \int_0^t \Lambda_n(u)\, du.$$

Thus,

$$|||\, \Lambda_n \,|||_\omega \leqq \int_0^{2\pi} |\overline{\Lambda}_n(t)|\, dt,$$

the function $g(x) = \frac{1}{2\pi} sgn \int_0^x \Lambda_n(t)\, dt$ is in C_ω and $||g||_\omega \leqq 1$. Also

$$\int_0^{2\pi} g(t)\, \Lambda_n(t)\, dt = \left| g(2\pi)\, \Lambda_n(2\pi) - \int_0^{2\pi} |\overline{\Lambda}_n(t)|\, dt \right| \geqq \int_0^{2\pi} |\overline{\Lambda}_n(t)|\, dt - \lambda_0.$$

Thus,

$$\int_0^{2\pi} |\overline{\Lambda}_n(t)|\, dt - \lambda_0 \leqq |||\, \Lambda_n \,|||_\omega \leqq \int_0^{2\pi} |\overline{\Lambda}_n(t)|\, dt \qquad n = 1, 2, \ldots$$

This shows that (4.2) is necessary and sufficient for (λ_k) to be in (c_ω, C_F) if $\omega(h) = h$.

Finally in the general case, the inequality

$$\left|\left| \int_0^{2\pi} f(t)\, \Lambda_n(t-x)\, dt \right|\right|_\omega \leqq \omega(\mu_n) \int_0^{2\pi} |\Lambda_n(t)|\, dt$$

is a simple modification of Lemma 1 of [11] and we will not give its proof.

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