$\frac{12}{5}-1$ $\frac{5}{2}$ $\frac{12}{5}$ (2,6) (2)

$\frac{7}{12}$ $\frac{12}{5}$

Short sketch of proof. $w = u + iv$

$$|S(\Omega_i)|^2 \le \frac{1}{\pi\rho^2} \iint_{|w-w_0|\le\rho} |S(w)|^2 \, du\, dv.$$

$i \neq j$

if $|w_i - w_j| \ge 2\rho$; $\rho \le \frac{1}{N}$ / $\rho = \frac{1}{2(N+Q^2)}$

$$\sum |S(w_i)|^2 \le \frac{1}{\pi\rho^2} \iint_{\substack{0\le u\le 1 \\ |w|\le\rho}} |S(w)|^2 \, du\, dv \qquad \rho = \frac{1}{N}.$$

$$\le \frac{2\rho}{\pi\rho^2} \sum |a_n|^2 e^{\frac{N}{2}\pi\rho}$$

$$\sum |S(w_i)|^2 \le \frac{c}{\rho} \sum |a_n|^2$$

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in our case $\rho = \dfrac{1}{N+Q^2}$

F; ϕ_i Hilbert space.

$$\sum_i \frac{|(F,\phi_i)|^2}{\sum_j |(\phi_i,\phi_j)|} \le \|F\|^2$$

$$\sum |(F,\phi_i)|^2 \le \|F\|^2 \cdot \max_i \sum_j |(\phi_i,\phi_j)|$$

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more generally.

$$\|F - \sum \chi_i \phi_i\|^2$$

$$= \|F\|^2 - 2R \sum \chi_i (\phi_i, F) + \sum_{i,j} \chi_i \bar{\chi}_j (\phi_i,\phi_j)$$

if $H \ge ((\phi_i,\phi_j))$ then. $H^{-1} = (g_{ij})$

(3)

$$\|F\|^2 - \bar{L}'X - \bar{X}'L + \bar{X}'\bar{H}X$$

$$- \bar{L}'dX - d\bar{X}'L + \bar{X}'\bar{H}dX + \cdots$$

$$\bar{X}'\bar{H} = \bar{L}' \qquad \bar{X}' = \bar{L}'\bar{H}^{-1}$$

$$\|F\|^2 - 2\bar{L}'\bar{H}^{-1}L + \bar{L}'\bar{H}^{-1}L$$

$$\bar{L}'\bar{H}^{-1}L \leq \|F\|^2$$

$$\sum_{ij} \overline{(F,\phi_i)}\,(F,\phi_j)\,q_{ij} \leq \|F\|^2$$

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let. an defined on integers $M \leq n \leq M+N$

1 $\phi_{q,e}(n) = \begin{cases} 1 & \text{for } n = e(q) \\ 0 & \text{otherwise.} \end{cases}$

$e \pmod d$
$q \leq Q$

2 $e^{2\pi i \frac{a}{q} n}$ $\quad a \pmod q$ $\quad (a,q) = 1 \; ; \; q \leq Q$

3 $\chi(n)$ $\quad \chi \bmod q \; ; \; q \leq Q$

Go through 3 cases. In (3), take primitive χ; ~~In (2)~~ In (1) functions not independent complicates minimum problem, also not nearly orthogonal, compensate by introducing restraints on $\xi_{q,e}$; $\sum_e \xi_{q,e} = 0$ for summation over all $e \equiv l_0 (q_0)$ where $q_0 | q$; $q_0 < q$; assume set S interval like.