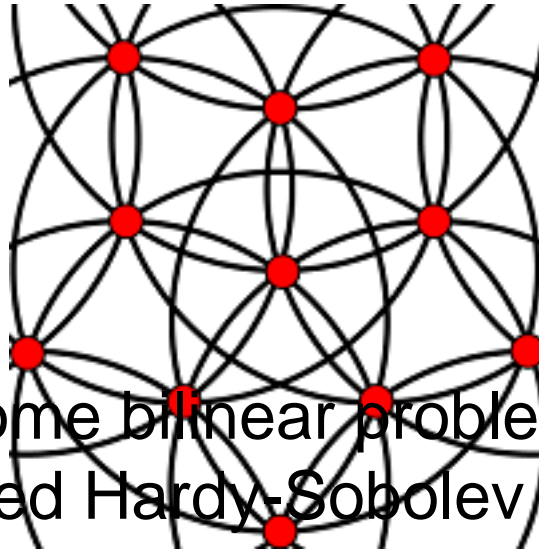


CSASC 2013



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On some bilinear problems on weighted Hardy-Sobolev spaces

Content :

If w is a weight in $(\mathbf{S})^n$, the weighted Hardy-Sobolev space $H_s^p(w)$,

$0 \leq s \leq n$, $1 < p < +\infty$, consists of functions f holomorphic in \mathbb{B}^n such that if

$f(z) = \sum_k f_k(z)$ is its homogeneous polynomial expansion, and

$(I+R)^s f(z) = \sum_k (1+k)^s f_k(z)$, we have that

$$\|f\|_{H_s^p(w)}^p = \sup_{r < 1} \int_{(\mathbf{S})^n} (I+R)^s f(r\zeta) |w(\zeta)|^p d\sigma(\zeta) < +\infty.$$

For fixed $0 \leq s, t \leq n$, and w a weight in the Muckenhoupt class A_p ,

we study the positive Borel measures μ on the unit sphere of \mathbb{C}^n , $(\mathbf{S})^n$,

for which the following bilinear problem holds: There exists $C > 0$ such that for any $f \in H_s^2(w)$,

$$g \in H_t^2(w),$$

$\begin{equation*}$

$$\sup_{\rho < 1} \left| \int_{(\mathbf{S})^n} f(\rho\zeta) \overline{g(\rho\zeta)} d\mu(\zeta) \right| \leq C \|f\|_{H_s^2(w)} \|g\|_{H_t^2(w)}.$$

$\end{equation*}$

We will give characterizations of this bilinear problem in two situations: for s, t non necessarily equal, under some restrictions on s, t and the

weight w , and when $s=t$ in a more general situation. (Joint work with Joaquín M. Ortega.)

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