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Interpolating sequences for the Dirichlet space

In the 1950's Buck raised the question of whether or not there exists an infinite subset $Z = \{z_j\}_{j=1}^\infty$ of D that is interpolating for $H^\infty(D)$. In 1958 Carleson gave an affirmative answer and characterized all such interpolating sequences in the disk. In 1961 Shapiro and Shields demonstrated the equivalence of this problem with certain Hilbert space analogues involving $\ell^2(\mu)$ where $\mu = \sum_j k_{z_j}(z_j)^{-1}\delta_{z_j}$ and k_z is the reproducing kernel. Suppose that $Z = \{z_j\}_{j=1}^\infty \subset D$ is separated and let R be the restriction map $Rf = \{f(z_j)\}_{j=1}^\infty$. Then the results of Carleson and Shapiro and Shields show the following four conditions are equivalent: R maps $H^\infty(D)$ onto $\ell^\infty(Z)$; R maps $H^2(D)$ onto $\ell^2(\mu)$; R maps $H^2(D)$ into $\ell^2(\mu)$; $\mu\big(T(I)\big) \leq C|I|$ for all arcs $I \subset T$. In 1995 Marshall and Sundberg extended this theorem to the Dirichlet space $D(D)$ and its multiplier algebra $M_{D(D)}$, but without the second condition. In fact, as observed by Bishop in 1995, even when the measure μ is finite, R maps $D(D)$ onto $\ell^2(\mu)$ for sequences Z more general than those for which R maps $D(D)$ into $\ell^2(\mu)$. We give two results toward resolving the open question of when R maps $D(D)$ onto $\ell^2(\mu)$: the first is a geometric characterization of such Z in the case μ is a finite measure, and the second shows there are such Z with μ an infinite measure, thus answering a question of Bishop.