Dalzell, C. J.; **Ramsay, J. O.**

Computing reproducing kernels with arbitrary boundary constraints. (English)

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The space of all functions with $m-1$ absolutely continuous derivatives and a square-integrable mth derivative is denoted by H^m, $m \geq 1$. Smoothing with L-splines involves the use of the penalty term $\|x\|_2^2 = \int (Lx)^2(t)dt$, where L is an arbitrary linear differential operator of order m. This also involves the choice of m constraint functionals to define two orthogonal subspaces $H_1 = \ker L$ and a complementary subspace H_2 which partition H^m.

Computing the reproducing kernel for H_2 is generally difficult. This problem is mainly addressed in this paper and techniques for computing the kernels are developed and illustrated [cf. *G. Wahba*, Spline models for observational data, SIAM, Philadelphia, PA (1990; M.R. 91g:62028); and the authors, J. R. Stat. Soc., Ser. B, 53, No. 3, 539-572 (1991; M.R. 93e:62161)].

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