

We investigate optimal partnership of rearrangement-invariant Banach function spaces for the Hilbert transform and the Riesz potential. We establish sharp theorems which characterize optimal action of these operators on such spaces. These results enable us to construct optimal domain (i.e. the largest) and optimal range (i.e. the smallest) partner spaces when the other space is given. We illustrate the obtained results by non-trivial examples involving Generalized Lorentz–Zygmund spaces with broken logarithmic functions. The method is presented in such a way that it should be easily adaptable to other appropriate operators.