On the Factorization theorem in the space of Henstock-Kurzweil integrable functions

We apply the factorization theorem of Rudin and Cohen to the space of Henstock-Kurzweil integrable functions \( HK(R) \). This implies a factorization for the isometric spaces \( AC \) and \( BC \). We also study in this context the Banach algebra \( HK(R) \cap BV(R) \), which is also a dense subspace of \( L^2(R) \). This space is in some sense analogous to \( L^1(R) \cap L^2(R) \). However, while \( L^1(R) \cap L^2(R) \) factorizes as \( L^1(R) \cap L^2(R) \ast L^1(R) \), via the convolution operation \( \ast \), it will be shown that \( HK(R) \cap BV(R) \ast L^1(R) \) is a Banach subalgebra of \( HK(R) \cap BV(R) \). Joint work with Maria G. Morales