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Tepper L. Gill (tgill@howard.edu) and **Woodford W Zachary***
(wzachary@earthlink.net). *On the dual of Henstock-Kurzweil integrable functions in n
dimensions.*

The dual space of the class of Henstock-Kurzweil integrable functions is well-known in the one-dimensional case and corresponds to the space of multipliers which, in turn, coincides with the class of functions of bounded essential variation. Comparable results in higher dimensions have been elusive. We prove that a necessary condition that a function be a multiplier (and therefore corresponds to an element of the dual space) of the class of n -dimensional ($n > 1$) Henstock-Kurzweil integrable functions is that it be of bounded essential variation in the sense of Vitali-Lebesgue-Frechet-de la Vallee Poussin. In addition, we give a new proof that functions of strongly bounded essential variation, as defined by Kurzweil, are multipliers of the class of Henstock-Kurzweil integrable functions, and we discuss a class of n -dimensional examples of functions that are of bounded essential variation in the sense of Vitali et al but are not of strongly bounded essential variation. (Received May 16, 2000)