Naralenkov, K. M., On continuity and compactness of some vector-valued integrals. Rocky Mountain J. Math. 43 (2013), no. 3, 10151022. 28B05 (26A39 46G10)

The Henstock-Kurzweil-Pettis (HKP) integral is the generalization of the Pettis integral of a function, obtained by replacing the Lebesgue integrability of scalar functions by the Henstock-Kurzweil integrability. Bongiorno, Di Piazza and Musial in [Glasg. Math. J. 50 (2008), no. 3, 583593; MR2451753 (2010a:28020)] give an example of a c_0-valued indefinite HKP integral with relatively noncompact range. Moreover they pose the following question: *Assume that c_0 cannot be embedded isomorphically into a Banach space X. Can the range of each indefinite X-valued HKP integral be a norm relatively compact set?*

In the paper under review the author gives an answer to the question, by showing that any indefinite X-valued HKP integral has a relatively compact range if and only if any indefinite X-valued HKP integral is continuous, or equivalently, if and only if X is a Schur space,

Moreover he also proves that the indefinite integral of any X-valued HKP integrable function is continuous except at most on a countable set if and only if X contains no isomorphic copy of c_0.

Reviewed by (*L. Di Piazza*)