Zbl 0973.17041

Stachó, László L.

A counterexample concerning contractive projections of real JB*-triples. (English)

Publ. Math. 58, No.1-2, 223-230 (2001).
http://www.math.klte.hu/publi/index.php?p=1

In the first part of the article the author considers the complex vector space $\mathbb{C}^2$ equipped with the Jordan triple product

$$\{xyz\} := \tfrac{1}{2}\langle x|y\rangle z + \tfrac{1}{2}\langle z|y\rangle x$$

(there is a misprint in the paper), where $\langle|\langle$ denotes the canonical hermitian scalar product on $\mathbb{C}^2$. With $e_1 := (1,0)$ and $e_2 := (\frac{i}{\sqrt{2}}, \frac{1}{\sqrt{2}})$ the real-linear projection

$$P : \mathbb{C}^2 \to V := \mathbb{R}e_1 + \mathbb{R}e_2, \quad x \sum_{k=1}^{2} \Re\langle x|e_k\rangle e_k,$$

is contractive with respect to the JB*-norm associated to the above triple product, but the projected triple product $\{xyz\} := P(\{xyz\})$ on V violates the Jordan identity. This is a counterexample to the conjecture that the contractive linear image of a real JB*-triple is again a real JB*-triple with respect to the projected product. Closely related to this general problem is the structure of the complete polynomial vector fields on Hilbert balls, in the above example on the real twodimensional Euclidean disc $\mathbb{D}$. The author gives a precise description of those vector fields on $\mathbb{D}$.

E.Oeljeklaus (Bremen)

Keywords : JB^*-triple; real Jordan triple; complete vector field; contractive projection
Classification :
∗17C65 Jordan structures on Banach spaces and algebras
32M15 Symmetric spaces (analytic spaces)
46B20 Geometry and structure of normed spaces
46L70 Nonassociative selfadjoint operator algebras