IEEE Standard 1788-2015
vs.
Multidimensional RDM Interval Arithmetic

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Source (A) and Source (B) generate forces, signals, or equivalent.

IEEE Standard 1788-2015

Dependency issue
Wa and Wb are forces, signals or etc.

Source (A)

Wa=[1,3] → -1 → [-2,2] → [+][-1,5] ≠ Wb

Source (B)

Wb=[1,3]
Multidimensional RDM Interval Arithmetic

There is no dependency issue

Wa and Wb are forces, signals or etc.
IEEE Standard 1788-2015

Source (A) \( \rightarrow \) Wa \( \rightarrow \) -1 \( \rightarrow \) Wa \( \rightarrow \) Source (B)

\[ Wa \in \mathbb{R} \]
\[ Wb \in \mathbb{R} \]

Restoration issue
Multidimensional RDM Interval Arithmetic

There is no Restoration issue
Multidimensional RDM Interval Arithmetic

Source (A)

\[ Wa = 2\alpha_a + 1 \]
\[ \alpha_a \in [0,1] \]

Source (B)

\[ Wb = 2\alpha_b + 1 \]
\[ \alpha_b \in [0,1] \]

There is no Restoration issue

\[ W_a \in \overline{\mathbb{R}} \]
\[ W_b \in \overline{\mathbb{R}} \]

W is a force, signal or etc.
Some references for Multidimensional RDM Interval Arithmetic

• Karina Tomaszewska, Andrzej Piegat, Application of the horizontal membership function to the uncertain displacement calculation of a composite massless rod under a tensile load, Soft Computing in Computer and Information Science, Volume 342, 2015, pp 63-72