

Erratum: Functions of multivectors in 3D Euclidean geometric algebra via spectral decomposition (for physicists and engineers)

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There is an incorrect formula in the chapter 2. Functions of multivectors

$$f(u_{\pm}) = f(\pm 1)u_{\pm}.$$

From $M = M_+u_+ + M_-u_-$ and $f(M) = f(M_+)u_+ + f(M_-)u_-$ we have

$$f(u_{\pm}) = f(1)u_{\pm} + f(0)u_{\mp}.$$

We see now that the logarithm of idempotents is not defined, since $\log(0)$ is not defined. There is another form of the logarithm formula

$$\log M = \log |M| + \varphi \hat{F},$$

however, we have $|u_+| = \sqrt{u_+u_-} = 0$, which leads to the same conclusion.