

The packet representation of interval in Kurpishev Time@Space

Ivan B. Kurpishev

2026

Abstract

This paper introduces a packet notion of interval for the structure Time@Space. It is shown that the Galilean and Einsteinian intervals enter this framework as limiting or degenerate cases.

1 Packet interval

Definition 1.1. The packet interval is the quantity

$$\mathcal{I}_{\text{pack}} = \sum_{k=-1}^3 \sigma_k (c_k^2 dt_k^2 - d\mathbf{x}_k^2) + \Lambda_{\Upsilon} + \Lambda_{\text{proj}}.$$

2 Galilean limit

Proposition 2.1. *If stratification is switched off, $\Lambda_{\Upsilon} = 0$, $\Lambda_{\text{proj}} = 0$, and the limiting velocity is treated as infinite, the packet interval degenerates into the Galilean regime with absolute time and independent space.*

3 Einsteinian limit

Proposition 3.1. *If only one external electromagnetic layer remains active with fixed velocity c , the packet interval reduces to the Minkowski interval*

$$ds^2 = c^2 dt^2 - d\mathbf{x}^2.$$

4 Conclusion

The packet interval is the general stratified form inside which the Galilean and Einsteinian intervals acquire the status of special reductions.