Towards a Fundamental Language: Interaction, Observation, and Symbolic Reality

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1 Introduction

Language is typically conceived as a complex, emergent phenomenon linked to biological evolution and cognitive processes. Human language, formal logical systems, and even computer code are generally viewed as arising from specific, contingent developments within the universe. This paper challenges that perspective, proposing instead the existence of a more primordial structure: a **Fundamental Language (FL)**. We posit that this FL is not an abstract description tool, but an aspect of reality itself, a symbolic system that underlies and encodes the dynamics of physical states and interactions.

A crucial distinction must be drawn regarding the nature of FL. We propose that the *capacity* for this symbolic encoding – encompassing the underlying rules or "grammar" defining how changes of state *can* be represented across different levels of complexity – possesses an *a priori* character. This fundamental capacity, embedded within the basic laws of physics and the intrinsic properties of energy and matter, holds a latent hierarchical or multi-dimensional structure. While the full potential exists fundamentally, its various layers or dimensions become manifest and applicable hierarchically, activated by the emergence of corresponding complexity through cosmological and derived events. In contrast, the actual *instantiation* of symbols and symbolic strings within this language – the specific "utterances" describing reality – arises *a posteriori*, generated by physical events unfolding since the universe's inception.

The bridge between the latent potential of the FL's structure and its continuous actualization is the process of "observation." Here, observation is defined non-anthropocentrically and fundamentally: **any physical interaction that results in a measurable, therefore distinguishable change of state constitutes an observation** within this framework. Each such interaction acts as a generative mechanism, instantiating symbols within the FL and effectively "writing" the evolving state of the universe into its symbolic fabric. The history of the cosmos, necessarily therefore existing as "history," something consisting of symbols, can be viewed as a continually unfolding succession of symbols composed in this fundamental language.

The origins of instantiated FL can be traced back to the nascent universe. The transition from the primordial chaos of the Big Bang to the emergence of the first stable, distinguishable structures – the formation of elementary particles – represents the instantiation of the most basic symbolic elements, which we term **level 0 symbols**. Subsequent interactions, governed by physical laws, build upon these initial symbols, creating increasingly complex structures and leading to an inherent hierarchy within the FL's representations. It is the idea that FL is constructed hierarchically, with each level of complexity building upon the previous one, that allows us to understand the evolution of the universe as a continuous process of symbolic instantiations.

The objective of this work is to formally develop and explore the concept of this Fundamental Language. We build upon and extend the mathematical formalisms introduced in previous work [**?**], particularly the **Fundamental Interaction Language (FIL)** framework. FIL provides the mathematical arena, **Local Language Constructors (LLC)** serve as the mechanisms for minimal and efficient symbolic transformation (communication/interaction bridges), and the established **Quantum-FIL Correspondence** provides deep connections to measurement principles. In this paper, these tools are adapted and refined to model the structure, properties, and dynamics of the proposed FL. Subsequent sections will delve into the formal definitions underpinning the FL, explore its hierarchical nature, analyze its relationship with information conservation and measurement theory, and discuss its potential implications for unifying perspectives across physics, knowledge representation, and computation.