

Exploration of structural and kinetic components of physical information

We know that “information is information, no matter, no energy”. Physically, information is deeply grounded in energy transformation processes. To show this, the concept of two complementary informative influences on energy transformation will be demonstrated with the model of an idealized monochord instrument (the monochord as a conservative system without considering dissipation). Information contained in the kinetics of the oscillating string can then be modeled as both:

- *generated by the structure of the instrument* (spatial harmonics) and as
- *generating non-arbitrary motion structures* (harmonic resonance) in other instruments with similar spatial harmonics due to similar scale, geometry and material properties.

The idea of a reciprocal relationship between information kinetically transported in excited modes of media and information structurally represented by configuration is intriguing. It definitely is interesting, when adopting an evolutionary perspective. From an evolutionary perspective, the capacity to adapt to and to interact with environmental influences on structural integrity (structural stability) is seen as continuously evaluated by the process in time. Information in such a perspective could be described as both a *store* for patterns and relations between elements and *as an influence* on differential perpetuation respectively –said with the terms of a biologist - as a selecting influence. Modes of motion, in our model the spatial harmonics which the string can represent, can be superimposed, while configuration structures obey the Pauli principle. Both carry information but the dynamics of storage and selection differ strongly. The talk will develop this idea and present the state of research of the author, leaving room for discussions. SUBMITTED 29.04.2019.