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Levels of habitability and the origin of life

Pauli Laine
University of Jyväskylä, Jyväskylä, Finland (pauli.e.@jyu.fi)

We can determine habitability of some environment by comparing it's certain parameters to environments where extremophilic micro-organisms thrive on Earth. We can also define more common habitability criteria from the life as we know it. These criteria include basic elements, liquid water, and an energy source.

We know that there have been periods of very different atmospheric, surface and subsurface conditions on Earth. These include hot Hadean period, Late Heavy Bombardment period, Snowball Earth period etc. Early biosignatures indicate, however that life started early, some 3.5 billion years ago. How can we combine our knowledge of changing parameters in esp. temperature (and therefore liquid water), pressure, and chemical composition of the environment with the origin and evolution of life?

In this paper, I will demonstrate model for expanding the concept of habitability with different levels. One level is where life possibly originated, another level is that helped more complex life to emerge, and there are also levels where current life on Earth thrives. We will notice that interfaces between different levels are also important factor in the origin and evolution of life. One planet or other planetary target can contain multiple levels of habitability and also uninhabitable locations. We can use these levels to define habitability of some planetary target, which is important for searching extraterrestrial life and planetary protection. Some examples are included.