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Flowing processes in a punctuated species change G. *pleisotumida* to G. *tumida* displaying feedback driven evolution

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Abstract. - New analytic methods show that the step change in size that accompanied the species change from the plankton G. pleisotumida to G. tumida 5.5 Myr ago was produced by a transient flowing process that accelerated and decelerated. The evolutionary mechanisms needed to explain that could also explain the general pattern of gaps in the fossil record. Mathematical tests for internal symmetry and continuity and the physical mechanisms rule out random walk. Light and strong smoothing display the clear shapes of growth and complex fluctuation in a continuous process indicating process animation by feedback typical of natural growth systems. An evolutionary mode of branching in the organism's growth limits with 'facilitated variation' in the genome reported by others would permit an organism's developmental control system to actively explore local fitness landscapes with feedback. Ways of searching for other examples of transient flowing change in the fossil record are discussed.

Keywords: planktonic foraminifera, pattern recognition, evolution, punctuated equilibrium, random walk, growth, complex systems, feedback animation