1116-00-1117   **Claude M. Viallet*** (`viallet@lpthe.jussieu.fr`). *Singularity and algebraic entropy analysis of a delay-differential equation.*

We analyze some algebraic properties of the delay-differential equation $a\,u(t) - b\,\partial_t u(t) = u(t)\,(u(t+1) - u(t-1))$. This equation may be obtained by a symmetry reduction of an integrable lattice equation. It is a slight generalization of the so-called one-dimensional Born-Green-Yvon equation for a hardrod fluid. Even if the original notion of integrability (à la Liouville) is barely applicable to this kind of equations, one would like to call it integrable delay-differential equation. The naming "delay Painlevé equation" was also proposed.

Considering the above equation as an order two recurrence on functional space allows to evaluate its algebraic entropy. Moreover the stabilization of the form of the iterates, in relation to the singularity analysis, gives not only a proof of the validity of the heuristic evaluation of the entropy, but suggests a change of description of the equation, allowing to write a generic form of the solutions in terms of entire functions.

Keywords: Discrete dynamical systems, algebraic entropy. (Received September 17, 2015)