## **Accepted Manuscript**

A new approach to the use of Lyapunov's functions. I. Stability and qualitative properties of paths in gas-solid systems

Stanisław Sieniutycz

PII: \$0307-904X(16)30666-7 DOI: 10.1016/j.apm.2016.12.013

Reference: APM 11475

To appear in: Applied Mathematical Modelling

Received date: 3 August 2015
Revised date: 26 October 2016
Accepted date: 15 December 2016



Please cite this article as: Stanisław Sieniutycz , A new approach to the use of Lyapunov's functions. I. Stability and qualitative properties of paths in gas-solid systems , *Applied Mathematical Modelling* (2016), doi: 10.1016/j.apm.2016.12.013

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#### ACCEPTED MANUSCRIPT

### Highlights

- An insightful approach showing the role of thermodynamics in stability problems
- Thermodynamic potentials as Lapunov functions for equilibrium singular points
- Lapunov functions for disequilibrium singular points derived from rates of produced entropy
- A modification of the traditional approach to stability testing

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