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► **To cite this version:**

Sette Diop, Jean-Philippe Steyer, Ivan Simeonov. Dynamic estimation of specific growth rates of bacteria for an anaerobic wastewater treatment process. 17th International Conference on System Theory, Control and Computing, Oct 2013, Sinaia, Romania. hal-00828771v1

HAL Id: hal-00828771

<https://centralesupelec.hal.science/hal-00828771v1>

Submitted on 31 May 2013 (v1), last revised 17 Jun 2013 (v2)

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Dynamic estimation of specific growth rates of bacteria for a wastewater treatment process

S. Diop¹ and J. P. Steyer²

Abstract—The paper proposes an observability analysis and estimation schemes for specific growth rates for a wastewater treatment process. A 2-stage model of 6 dynamic states is assumed, describing the acidogenesis and methanogenesis of two different populations of microorganisms (acidogenic and methanogenic), and the evaluation of the total carbon dioxide production including the soluble part. The main result is that the specific growth rates of the two populations of bacteria can be stability estimated only from easily measured quantities – the dilution rate and the flow rates of methane and carbon dioxide in the biogas.

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