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Sette Diop, Jean-Philippe Steyer, Ivan Simeonov

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

S. Diop<sup>1</sup> and J. P. Steyer<sup>2</sup>

**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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<sup>1</sup>S. Diop is with the CNRS, Laboratoire des Signaux et Systèmes, Supélec, Plateau de Moulon, 91192 Gif sur Yvette cedex, France, [diop@lss.supelec.fr](mailto:diop@lss.supelec.fr)

<sup>2</sup>J. P. Steyer is with the INRA, Laboratoire de Biotechnologie de l'Environnement, Avenue des Etangs, Narbonne 11100, France, [steyer@supagro.inra.fr](mailto:steyer@supagro.inra.fr)