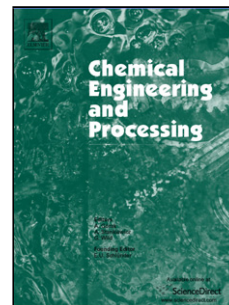


## Accepted Manuscript

Title: Optimal Campaigns in End-to-End Continuous Pharmaceuticals Manufacturing. Part 2: Dynamic Optimization

Author: Michael Patrascu Paul I. Barton



PII: S0255-2701(17)30851-6  
DOI: <https://doi.org/doi:10.1016/j.cep.2018.01.015>  
Reference: CEP 7170

To appear in: *Chemical Engineering and Processing*

Received date: 24-8-2017  
Revised date: 15-1-2018  
Accepted date: 18-1-2018

Please cite this article as: Michael Patrascu, Paul I. Barton, Optimal Campaigns in End-to-End Continuous Pharmaceuticals Manufacturing. Part 2: Dynamic Optimization, *Chemical Engineering & Processing: Process Intensification* (2018), <https://doi.org/10.1016/j.cep.2018.01.015>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Optimal Campaigns in End-to-End Continuous Pharmaceuticals Manufacturing. Part 2: Dynamic Optimization

Michael Patrascu, Paul I. Barton\*

*Process Systems Engineering Laboratory, Massachusetts Institute of Technology, Cambridge,  
Massachusetts 02139, United States*

---

## Abstract

We investigate theoretical optimal campaigns in a continuous process of pharmaceuticals production. The simulated process, inspired by a pilot plant previously tested at MIT, includes several reaction and separation steps to produce final tablets. This paper, demonstrates the use of nonsmooth differential-algebraic equations (DAEs) framework for such optimal campaigns design.

We embed the model developed in the first part of this series in a dynamic optimization problem formulated as a hybrid discrete/continuous and nonsmooth problem. We enforce the quality constraints only on an interior epoch (on-spec) and optimize its duration. We then use a gradient-based optimization tool (IPOPT) to solve the problem. We consider the on-specification productivity over the entire campaign. Various control profiles are chosen as decision variables, as well as the timings of the control switchings. The yield and the productivity of the process are considered as objectives under a constant (short) time

---

\*Corresponding author. Tel.: +1 617 2536526.

Email addresses: [mikesp@mit.edu](mailto:mikesp@mit.edu) (Michael Patrascu), [pib@mit.edu](mailto:pib@mit.edu) (Paul I. Barton )

متن کامل مقاله

دریافت فوری ←

**ISIArticles**

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلید کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات