

## 带有反馈机制的单服务台排队系统的泛函重对数律

郭永江, 黄军飞

1. 北京邮电大学理学院, 北京 100876;
2. 中国科学院数学与系统科学研究院, 北京 100190

## Functional Law of Iterated Logarithm for Single Server Queue with Bernoulli Feedback

GUO Yongjiang, HUANG Junfei

1. School of Science, Beijing University of Posts and Telecommunications, Beijing 100876;
2. Academy of Mathematics and Systems Science, Chinese Academy of Sciences, Beijing 100190

- [摘要](#)
- [参考文献](#)
- [相关文章](#)

全文: [PDF \(311 KB\)](#) [HTML \(1 KB\)](#) 输出: [BibTeX](#) | [EndNote \(RIS\)](#) [背景资料](#)

**摘要** 本文考虑了一个带有贝努里反馈机制的单服务台排队系统. 我们将该系统的一些数量指标如队长过程, 忙期过程, 负荷过程的泛函重对数律的问题 转化为一个反射布朗运动相关的问题, 利用已有的布朗运动的重对数率的结果, 刻画了队长过程, 忙期过程, 负荷过程的重对数律.

**关键词:** [单服务台排队](#) [泛函重对数律](#) [强逼近](#) [贝努里反馈机制](#)

**Abstract:** In this paper, we consider the single server queue with Bernoulli feedback. We transfer the problem of functional law of iterated logarithm for queue length process, busy time process and the workload process into problems related to reflected Brownian Motion. By using properties of reflected Brownian Motion, we get the functional law of iterated logarithm for queue length process, busy time process and the workload process and determine the parameters there.

**Key words:** [single server queue](#) [functional law of iterated logarithm \(FLIL\)](#) [strong approximation](#) [bernoulli Feedback](#)

收稿日期: 2010-11-19;

基金资助:

国家自然科学基金(10901023, 11101050)和 中央高校基本科研业务费专项资金(BUPT2011RC0704)资助项目.

引用本文:

郭永江, 黄军飞. 带有反馈机制的单服务台排队系统的泛函重对数律[J]. 应用数学学报, 2012, (4): 586-594.

GUO Yongjiang, HUANG Junfei. Functional Law of Iterated Logarithm for Single Server Queue with Bernoulli Feedback[J]. Acta Mathematicae Applicatae Sinica, 2012, (4): 586-594.

[1] Chen H, Yao D D. Fundamentals of Queueing Networks. New York: Springer-Verlag, 2001

[2] Iglehart D L. Multiple Channel Queues in Heavy Traffic II: Law of the Iterated Logarithm. *Zeitschrift Wahrscheinlichkeitstheorie View. Geb.*, 1971, 17: 168-180

[3] Zhang H, Xu G. Strong Approximations for Open Queueing Network in Heavy Traffic. *Science in China (Chinese Version) (Series A)*, 1992, 35: 521-535

[4] Chen H, Shen X. Strong Approximations for Multiclass Feedforward Queueing Networks. *The Annals of Applied Probability*, 2000, 10: 828-876

### 服务

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [E-mail Alert](#)
- ▶ [RSS](#)

### 作者相关文章

- ▶ [郭永江](#)
- ▶ [黄军飞](#)

- [5] Gamarnik D, Zeevi A. Validity of Heavy Traffic Steady-state Approximations in Generalized Jackson. *The Annals of Applied Probability*, 2006, 16: 56-90
- [6] Horváth L. Strong Approximations of Open Queueing Networks. *Mathematics of Operations Research*, 1992, 17: 487-508
- [7] Karatzas I, Shreve S E. *Brownian Motion and Stochastic Calculus*, 2nd ed. New York: Springer-Verlag, 1991
- [1] 薛留根. 半参数回归模型中随机加权M估计的强逼近[J]. 应用数学学报, 2002, 25(4): 591-603.
- [2] 周勇, 吴长风. 随机左截断数据下乘积限估计的强逼近及其应用[J]. 应用数学学报, 1999, 22(4): 614-620.