

## 干扰温度受限的认知无线电系统中断概率分析

黄慧, 张朝阳, 程鹏, 仇佩亮

(浙江大学信息与电子工程学系, 浙江 杭州 310027)

收稿日期 修回日期 网络版发布日期 2007-9-20 接受日期

**摘要** 针对一个衰落条件下的多用户认知无线电系统, 该系统存在多个并行的认知链路, 其发送功率同时受主用户接收端干扰温度的限制以及各自的最大中断概率约束, 研究如何通过对各认知链路适当的功率控制来使其非中断传输概率的乘积达到最大, 以获得尽可能高的传输效率并保证各链路的共享公平性。首先, 对瑞利衰落、信道噪声和用户间信号干扰进行了合理的抽象与建模, 并给出了各认知链路的中断概率表达式, 将上述各认知链路传输概率乘积最大化问题近似为几何规划问题, 从而获得该问题的近似最优解。仿真结果表明, 这一近似解与实际最优解基本吻合。

**关键词** [认知无线电](#) [干扰温度](#) [中断概率](#) [几何规划](#)

**分类号** [TN914.3](#)

## Outage probability analysis of the cognitive radio system with interference temperature constraints

HUANGHui,ZHANG Zhao-yang,CHENG Peng,QIU Pei-liang

(Dept. of Information Science & Electronics Engineering, Zhejiang Univ., Hangzhou 310027)

### Abstract

The cognitive radio is proposed as a key technology for improving the utilization of the radio electromagnetic spectrum. In this paper, a multi-user cognitive system in Rayleigh fading channels is analyzed. Several cognitive links coexist in the same spectrum, and their transmission power is restricted by the interference temperature constraint in the primary receiver, as well as constraints on outage probabilities of each link. We study optimal transmission power allocation in order to improve the utilization of the spectrum and satisfy the fairness of each cognitive link. The Rayleigh fading, the channel noise and the interference signal from other cognitive links are all modeled, and the outage probability of the cognitive link is also given. The problem of maximizing the product of the transmitting rates subject to constraints on outage probability and interference temperature is posed as a geometric program. Simulation results show that the approximated solution matches the optimal one very well. <BR>

**Key words** [cognitive radio](#) [interference temperature](#) [outage probability](#) [geometric program](#)

DOI:

通讯作者

### 扩展功能

#### 本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(370KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [参考文献](#)

#### 服务与反馈

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [复制索引](#)
- ▶ [Email Alert](#)
- ▶ [文章反馈](#)
- ▶ [浏览反馈信息](#)

#### 相关信息

- ▶ [本刊中 包含“认知无线电”的 相关文章](#)
- ▶ [本文作者相关文章](#)

- [黄慧](#)
- [张朝阳](#)
- [程鹏](#)
- [仇佩亮](#)