

## MIMO认知无线电分布式波形自适应算法

魏飞\* 杨震\*

南京邮电大学宽带无线通信与传感网技术教育部重点实验室 南京 210003

## Decentralized Waveform Adaptation Algorithm for MIMO Cognitive Radio

Wei Fei Yang Zhen\*

Key Lab of Broadband Wireless Communication and Sensor Network Technology, Ministry of Education, Nanjing University of Posts & Telecommunications, Nanjing 210003, China

摘要

参考文献

相关文章

Download: PDF (286KB) [HTML](#) 1KB Export: BibTeX or EndNote (RIS) [Supporting Info](#)

**摘要** 该文研究在主用户干扰温度约束下多个竞争的MIMO认知无线电最大化自身信息速率的波形自适应问题。该文使用非协作博弈论将其表述为Nash均衡问题,给出了Nash均衡解存在唯一的条件,并提出了一种求解Nash均衡的带惩罚价格的分布式迭代注水算法,通过对干扰进行价格惩罚使得MIMO认知无线电在达到Nash均衡时满足干扰温度约束。仿真结果表明相对于不考虑干扰温度约束的经典迭代注水算法,该文算法能够满足干扰温度约束,适用于认知无线网络。

**关键词:** 认知无线电 多入多出 波形自适应 Nash均衡 迭代注水算法

**Abstract:** This paper addresses the waveform adaptation issue of multiple competitive Multiple-In Multiple-Out Cognitive Radios (MIMO-CR) respectively maximizing their information rates under the interference-temperature constraint of primary users. This issue is formulated as a Nash equilibrium issue from a non-cooperative game theoretic viewpoint, conditions for the existence and uniqueness of the Nash equilibrium are provided and a decentralized Iterative Water-Filling Algorithm (IWFA) with a punishing price is proposed to solve the above Nash equilibrium issue, the punishing price is imposed on the interference generated by MIMO-CRs in order to make the interference-temperature constraint satisfied while MIMO-CRs achieve the Nash equilibrium. Simulation results show, when compared to the classical IWFA which does not consider the interference-temperature constraint, the proposed algorithm satisfies the interference-temperature constraint and hence is applicable to cognitive radio networks.

**Keywords:** Cognitive Radio (CR) Multiple-In Multiple-Out (MIMO) Waveform adaptation Nash equilibrium Iterative Water-Filling Algorithm (IWFA)

Received 2010-10-09;

**本文基金:**

国家863计划项目(2009AA012241)和国家自然科学基金(61001077)资助课题

**通讯作者:** 魏飞 Email: feiwei.nupt@gmail.com

**引用本文:**

魏飞, 杨震.MIMO认知无线电分布式波形自适应算法[J] 电子与信息学报, 2011,V33(6): 1356-1360

Wei Fei, Yang Zhen.Decentralized Waveform Adaptation Algorithm for MIMO Cognitive Radio[J] , 2011,V33(6): 1356-1360

**链接本文:**

<http://jeit.ie.ac.cn/CN/10.3724/SP.J.1146.2010.01074> 或 <http://jeit.ie.ac.cn/CN/Y2011/V33/I6/1356>

### Service

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

### 作者相关文章

- ▶ [魏飞](#)
- ▶ [杨震](#)