A Low-complexity Practical Energy Saving Algorithm for Real Dense Wireless Scenario

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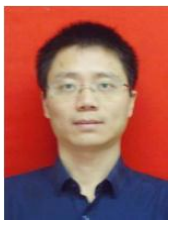
***Abstract*—In this paper, a low-complexity practical energy saving algorithm by switching off/on some eNBs in a real dense urban scenario considering historical and real-time eNB load is proposed. First, eNBs are ranked according to their loads in an ascending order and the first eNB in the list with load decreasing and smaller than a low threshold is pre-selected as target switching off cell. Then, the effect of the target switching off eNB on neighbour eNBs is evaluated. The target eNB switches-off while the load of neighbour eNBs after the eNB switches off is smaller than another threshold. Since estimation of the additional load on the neighbour eNBs due to the switch-off eNB is of high complexity, a fast estimation algorithm considering the whole eNB load by a traffic load conversion coefficient is proposed. The traffic load conversion coefficient declines slowly with the increasing of site traffic load. Third, the switching-off eNB can be switched on by the active eNBs in a distributed way. Based on the load changes in a week period of the eNB, the cumulative probability distribution of normalized load is analyzed, and then the threshold value of the eNB in different periods is evaluated. The energy saving ratio is obviously related with the interval between the switched on or off threshold values and the complexity of the algorithm is significantly reduced. Simulation results show that the proposed energy saving scheme can save up to 24% energy consumption and with low system complexity.**

***Keyword*—energy saving, practical, energy efficiency, switch off/on**



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