Stochastic Economic Dispatch with Wind using Versatile Probability Distribution and L-BFGS-B Based Dual Decomposition - DTU Orbit (16/12/2018)

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This paper focuses on economic dispatch (ED) in power systems with intermittent wind power, which is a very critical issue in future power systems. A stochastic ED problem is formed based on the recently proposed versatile probability distribution (VPD) of wind power. The problem is then analyzed and proved to be strictly convex. Although such convex optimization is tractable in many cases, it may take a long time to solve due to its large scale. This paper proposes a dual decomposition method to decompose the large problem. Then two methods are employed to solve the decomposed problem, namely, the subgradient method and a faster method, limited-memory BFGS with box constraints (L-BFGS-B, a quasi-Newton method). Case studies were conducted to verify the efficiency of the dual decomposition and L-BFGS-B method for solving the stochastic ED problem

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