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Abstract: This paper is on the problem of short-term hydro scheduling (STHS), particularly concerning a head-dependent hydro chain. We propose a novel mixed-integer nonlinear programming (MINLP) approach, considering hydroelectric power generation as a nonlinear function of water discharge and of the head. As a new contribution to the studies, we model the on-off behavior of the hydro plants using integer variables, in order to avoid water discharges at forbidden areas. Thus, an enhanced STHS is provided due to the more realistic modeling presented in this paper. Our approach has been applied successfully to solve a test case based on one of the Portuguese cascaded hydro systems with a negligible computational time requirement. (C) 2010 Elsevier B.V. All rights reserved.

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