CREATION OF X-RAY HOLES WITH COOL RIMS IN COOLING FLOWS
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abstract The density irregularities and holes visible in many Chandra X-ray images of cluster and galactic cooling flows can be produced by symmetrically heated gas near the central galactic black hole. As the heated gas rises away from the galactic center, a relatively small number of large plumes and bubbles are formed in qualitative agreement with the observed features. The expanding centrally heated gas drives a shock into the surrounding gas, displacing it radially. Both computational and analytic results show that the ambient gas near the bubble is cooled by expansion, accounting for the cool rims commonly observed around X-ray holes in cooling flows.