Review of "Impacts of global open fire aerosols on direct radiative, cloud and surface-albedo effects simulated with CAM5," by Jiang et al.

In this paper, Jiang et al. use a global climate model and two approaches to estimate the radiative forcing and climate impacts of aerosols from fires. They consider both black carbon (BC) and primary organic matter (POM) and all three categories of radiative effects – from aerosol-radiation interactions (ARI), aerosol-cloud interactions (ACI), and the effects of BC on snow. The approach used by the authors represents an improvement over past model studies since they use an updated aerosol module, finer spatial resolution, and two approaches to calculate radiative effects. The authors report an annual mean ARI radiative effect from fire aerosols of 0.16 ± 0.01 W m^{-2}, and an ACI radiative effect of -0.70 ± 0.05 W m^{-2}. They find a decrease in global mean surface temperatures by -0.03 K, with local cooling as large as -1 K. Precipitation also decreases in some regions due to a more stable boundary layer and reduced convection.

The authors have carefully responded to the main criticisms from the first round of reviews, and I have only minor comments. For example, the paper now clearly states how this work builds on prior model studies, and it describes the mechanisms that drive the spatial and temporal patterns of radiative effects and climate response.

Minor criticisms.
Line 280-282. Why is the OC to BC ratio in emissions of forest fires almost 3 times higher than that from other kinds of fires (grassland, savannah, and deforestation)?

Lines 428-431. The authors note that the sum of ARI radiative effects from individual components (BC and POM) is greater than the radiative effects due to all aerosols. They then state that this is evidence of nonlinear interactions among aerosol components. The reader would appreciate more details on these nonlinear interactions, perhaps an example.

Lines 450-452. Again some explanation or examples of nonlinear interactions affecting ACI radiative effects would be helpful.