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AUTHOR'S REPLY TO COMMENT

Field *et al.* (1967) treatment of a heating particle is correct but the numerical example treats a not-so-interesting case which may lead to a misleading conclusion. In their case a 100 μm particle is subject to a heat flux of 41.8 W/cm^2 (10 cal/cm^2 s) which causes a heating rate of 1.2×10^4 K/s. The difference in the temperature between the surface and the center (ΔT) is 42 K. Gat (1986) treats a case in which the heating rate is 2×10^5 K/s which according to Field's analysis would result in a $\Delta T = 700$ K. Further, Gat calculates internal temperature distribution in the presence of an endothermic (pyrolysis) reaction. This is equivalent to a reduction in the thermal diffusivity (due to the capacity to absorb heat by the reaction), further increasing the internal ΔT. This effect is further demonstrated when the thermal conductivity is changed by factor of three (Figures 3 and 4; Gat 1986); this change increased the ΔT from roughly 200 K to 600 K.

The internal ΔT is thus shown to be directly related to the particle's thermal properties, and small variations in these properties can change the internal ΔT from a benign to a very significant value (in particular at heating rates applicable to high intensity combustors). Since the thermal conductivity of coals may vary (Smoot, *et al.*, 1985, list thermal conductivities ranging over a factor of 4), one should not rush to the conclusion that the particle's temperature is always uniform.

Finally, the ordered "rocketing" effect observed in the laser heating experiments (Figure 1; Gat, 1986) cannot be explained if the particle temperature were uniform.

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