Del Bianco *et al.* Reply: Balogh *et al.* [1] comment that our evidence [2] for the appearance of a fcc phase of Fe at grain boundaries of ball-milled Fe samples is ambiguous and suggest that impurities, particularly C, could be responsible for the Mössbauer, magnetization, and transmission electron microscopy (TEM) data that we have ascribed to that *new* phase. Although the role of minute traces of contaminants is always difficult to discern, we sustain our interpretation as explained hereafter.

Even though our Mössbauer hyperfine field data are comparable to those of Fe_3C, we have discarded this compound as the origin of the *new* phase on the following grounds: (i) The relative resonant area of the Mössbauer component at 21 T amounts to (8-9)% in the case of the annealer 32h-milled sample [3]. This means that about 3 % at. C should be present in the sample. Although our routine microscope x-ray dispersive analysis showed oxygen vestiges (below 1%), no carbon trace was ever detected; (ii) C impurities are known to result in major changes in magnetic parameters. In our samples the coercivity at room temperature is about 4 Oe, 1 order of magnitude smaller than the one expected [4] if 3 % at. C where present. The saturation magnetization of the 32h-milled Fe powders at $T = 5$ K is also very close to that of pure iron (221 emu/g); (iii) After annealing for one hour in the 600–650 °C temperature range, the *new* phase disappears and the bulk Fe behavior at all temperatures is restored. A hypothetical C concentration as above would not be compatible with this behavior.

It is not surprising in our view, that our measured hyperfine fields differ from those of ultrathin fcc Fe films, as the latter are known to have unusual values of their atomic magnetic moments and lattice constants, both being parameters to which hyperfine field values are finely tuned [5]. Since the isomer shifts in Fe arise mainly from the changes in the $3s$ wave function due to a change in the shape and occupancy of valence $3d$ orbitals from solid to solid, in our opinion there is no reason why antiferromagnetic fcc Fe precipitates in Cu matrix should be directly compared to the ferromagnetic fcc Fe phase we observed and which, in our hypothesis, results from a thermally induced rearrangement of the atoms located at the grain boundary of bcc nanocrystalline grains.

Concerning the TEM information, Balogh *et al.* [1] state that all of the spots in the diffraction pattern of Fig. 4 (including the encircled spots attributed to the fcc structure) can be indexed as the $\langle 111 \rangle$ zone of the bcc α-Fe. Contrary to that view, we argue that the existence of a second fcc phase can be ascertained on the following grounds: (a) Even if the positions of the allowed spots corresponding to the fcc $\{211\}$ orientation and the bcc $\{111\}$ orientations are not far from each other, they can be distinguished. For example, (311) fcc spots are expected to be positioned on a ring whose diameter is 4.5% bigger than that corresponding to the bcc (220) spots. In our pictures, spots on both rings are visible. (b) The geometrical arrangement of Fig. 4(b) is, in our view, most illuminating. It explains, on the one hand, the *observed* mutual orientation of the two phases in terms of an interfacial growth. Moreover, because of the abundance of (111) bcc crystallites, it implies that fcc crystals can seldom be found in other than (211) orientation. In consequence, although Balogh *et al.* rightly point out that detecting (200) reflections would have given further support to the proposal, this detection is very unlikely. Concerning x-ray diffraction data, not only fcc lines but *any* lines, except bcc Fe ones, are missing and, therefore, this absence cannot be used as an argument in favor of an impurity-stabilized phase, such as Fe_3C.

We conclude that, in the light of present knowledge about the quantitative role of impurities on magnetic properties, it is not tenable that C or other impurities might account for our observations. Therefore, the existence of an fcc-Fe phase at the boundaries of the ball-milled Fe grains remains, in our view, the most likely explanation.

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