Radu *et al.* Reply: In response to the preceding Comment [1] questioning the interpretation of the data presented by us in Ref. [2] we here report additional thermodynamic measurements of the phase transition boundary in the antiferromagnet Cs_2CuCl_4 near the critical saturation field B_c. These data provide more experimental evidence that the scaling law of the transition temperature T_c can be described by the universality class of 3D Bose-Einstein condensation (BEC) of magnons. In addition to new specific heat data, $C(T)$, we also measured the magnetocaloric effect (MCE) to follow the suppression of the magnetic order by the applied field down to much lower temperatures (50 mK) than in Ref. [2] and thus be able to make a more thorough test of the predicted universal power-law scaling $T_c(B) \sim (B_c - B)^{2/3}$.

The phase boundary between the low-field low-temperature cone ordered phase and the paramagnetic phase is shown in Fig. 1(c). The data come from locations of sharp peaks in $C(T)$ and field scans of the MCE, such as Fig. 1(a). The MCE describes the variation of the sample temperature upon adiabatically varying the field and anomalies occur near phase transitions. For a second-order phase transition line that ends in a $T = 0$ quantum critical point as it is the case here, the change of sign of $\Gamma_B = T^{-1}(dT/dB)_S$ at sufficiently low T occurs very close to the actual phase boundary $T_c(B)$ [3]; the observed overlap between $C(T)$ points of $T_c(B)$ and location of the MCE anomaly already at 0.15 K [see Fig. 1(c)] shows that this criterion is well satisfied here.

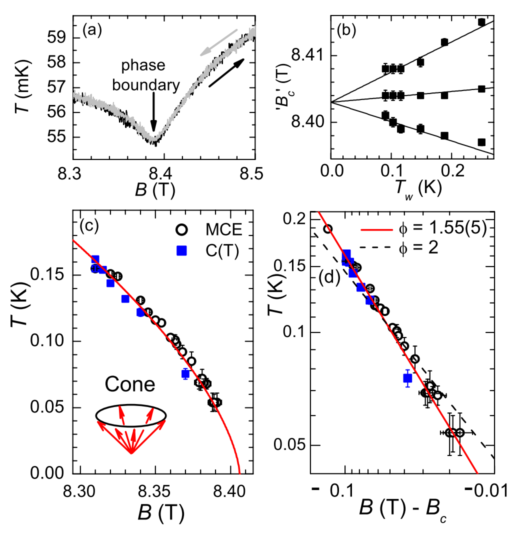

FIG. 1 (color online). (a) Temperature change upon adiabatic field scans. Black (gray) traces show up (down) field sweeps. Vertical arrow shows the phase boundary crossing point. (b) Estimates of the critical field B_c obtained from power-law fits to the low-temperature $T \leq T_w$ data at fixed $\phi = 1.6$, 1.5, and 1.4 (top to bottom). (c), (d) $T_c(B)$ data on linear (c) and log scales (d). The solid line is a power-law fit with $\phi = 1.55(5)$; the dashed line in (d) represents a power-law curve for $\phi = 2$.

Since a two parameter fit of the phase boundary data to $T_c(B) \sim (B_c - B)^{1/\phi}$ with both B_c and exponent ϕ varying can still be questioned [1,4,5], we applied a procedure proposed in Ref. [4] for an independent determination of B_c. The power law given above was fitted to the lowest temperature data points in a temperature window $T \leq T_w$ of gradually increasing size for several fixed exponents ϕ. The obtained critical field values B_c are plotted in Fig. 1(b) as a function of T_w. Their linear extrapolation to $T_w = 0$ shows good convergence to $B_c = 8.403(4)$ T [6] [Fig. 1(b)]. This value was then used in the power-law fit to the data below 0.17 K (over 20 points) and gave $\phi = 1.55 \pm 0.05$ (solid line in Figs. 1(c) and 1(d)], in good agreement with the BEC prediction of $\phi = 1.5$.

To conclude, the observed scaling of the critical temperature in the very close vicinity of the critical saturation field is in good agreement with predictions of 3D BEC in a dilute gas of magnons and rules out other possible universality classes. At fields sufficiently far away from B_c a departure from the BEC scaling form was observed and this will be discussed elsewhere [7].

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[6] The small difference between $B_c = 8.403(4)$ T and previous estimates [8.44(1) T and 8.51 T] may be partly due to small demagnetization fields in samples of different shapes and variations in the precise positioning in the calibrated field. To eliminate those uncertainties all data reported here was collected in one and the same experimental setup.
[7] T. Radu *et al.* (to be published).

