Radiationally-Cooled Tungsten & Carbon Rods

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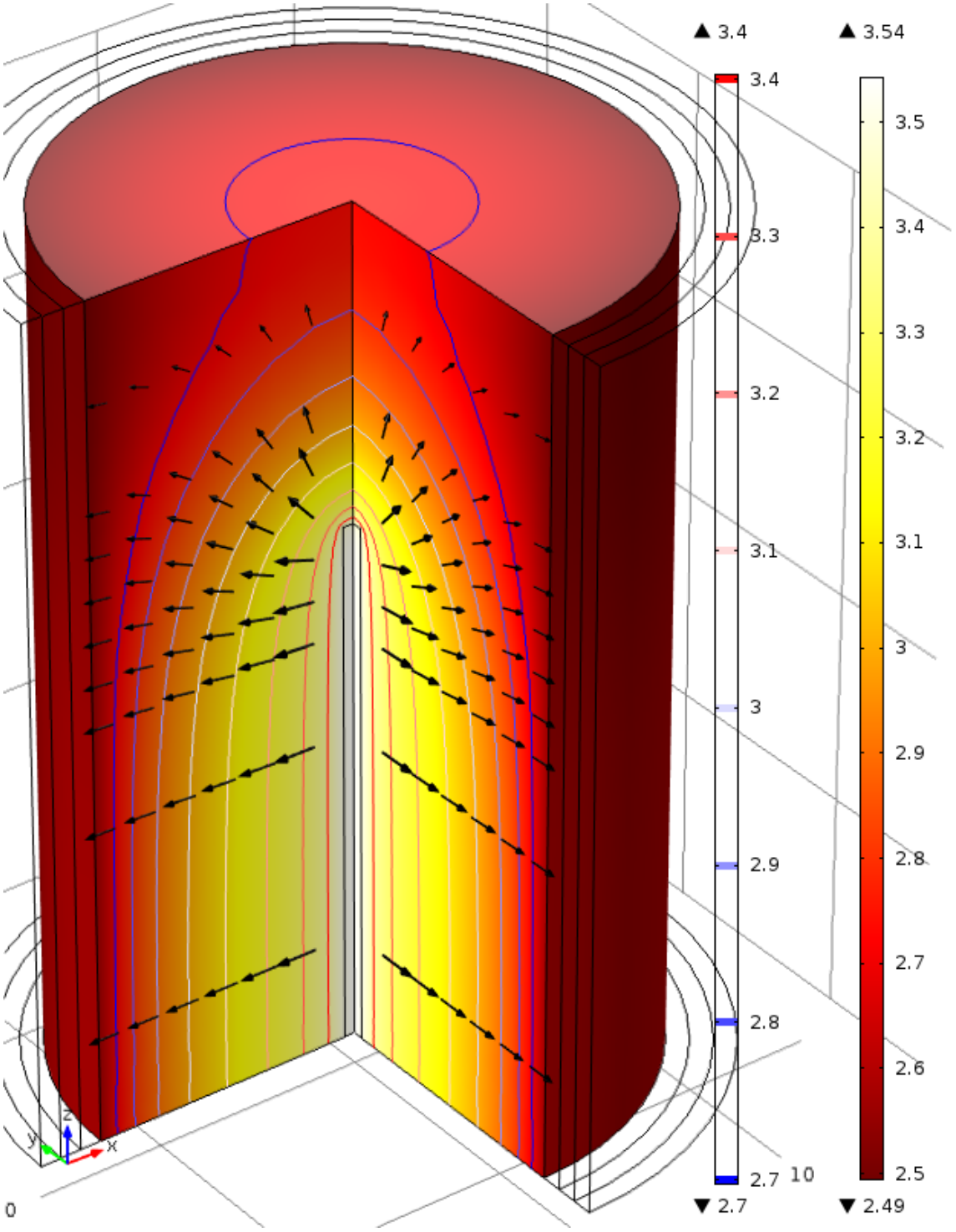
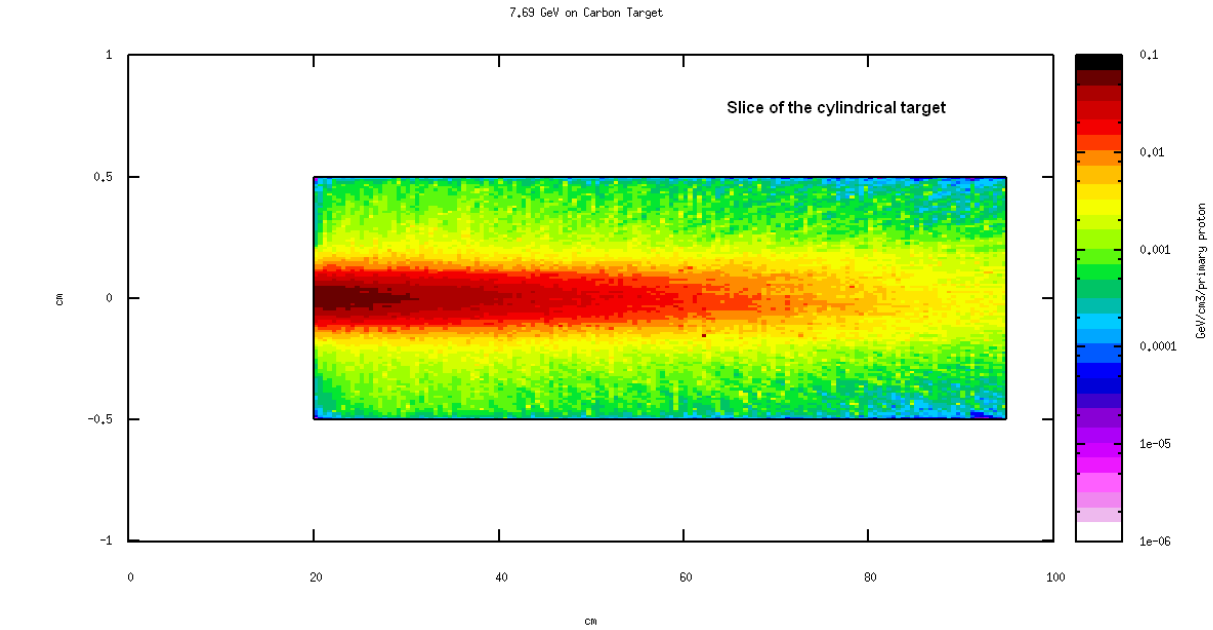


Fig. 1. Radiation direction (arrows) and $\log_{10}(T)$ of upper half of radiationally-cooled tungsten rod of 10-mm diameter and 50-cm length; uniform power-deposition density = [100kW/39.3 cm^3 = 2.55 kW/cm^3. $T_{max} = 10^{3.54}$ = 3,470 K.



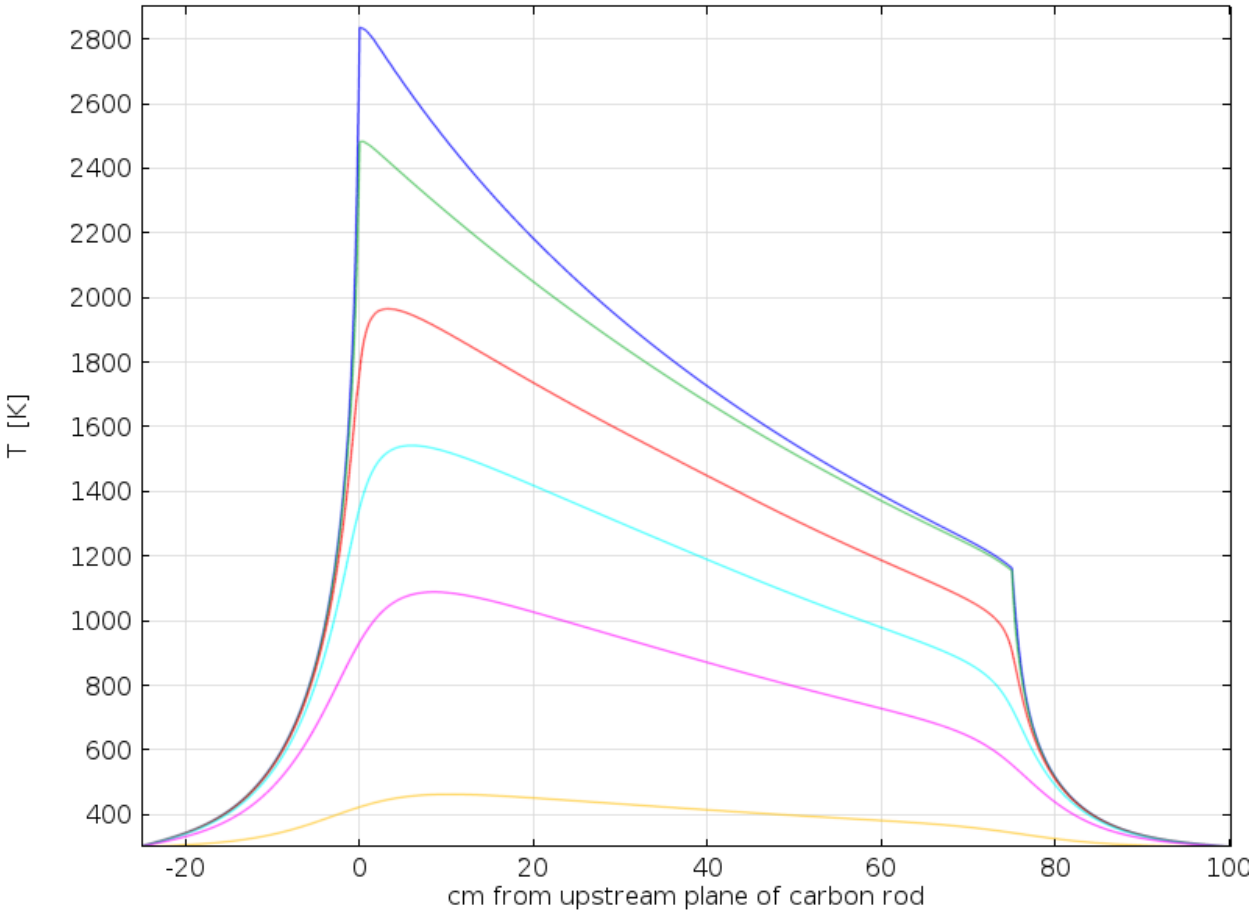


Fig. 2. T(z|r) of carbon rod of thermal conductivity k = 38+51,600/T W/m-K and power deposition density p = 596 $e^{-z/25}$ W/cm^3 (25 kW in a rod 15 mm in diameter and 75 cm long). Blue curve is along rod axis: T_{max} = 2,830 K; green curve is along its surface: T_{max} = 2,490 K. Red, cyan, pink and ochre and curves are r = 1.5, 3, 6 & 12 cm, respectively.