Non-linear convecting radiating fins: solutions, efficiency, entropy.

Federico Zullo

Università di Brescia

federico.zullo@unibs.it

The second order, nonlinear, ordinary differential equation describing the dissipation of heat in a convecting-radiating longitudinal fin is analyzed. The profile of the fin is arbitrary. With the introduction of an auxiliry variable, we obtain new solutions for the linear, purely convective, case and explicit solutions for the non-linear convecting-radiating case. The efficiency of the fin is discussed in both cases and it is compared with a novel introductiuon of the efficiency based on the entropy rates of the convecting-radiating processes.