on the initial jet energy Q. It gives an estimate for the time scale $\tau_0 \propto L_0$ of the global conversion process, and comes out rather long, namely for $L_c = 0.6\ fm$ we get $\tau_0 \approx 8.5$ (21) fm for $Q = 10$ (100) GeV, whilst for $L_c = 0.8\ fm$ the time scale is $\tau_0 \approx 10$ (26) fm for $Q = 10$ (100) GeV.

Immediate consequences of the values for B and χ_0 in (79) are the "critical temperature" for the phase transition in finite-temperature QCD,

$$T_c \;\equiv\; \left(\frac{9\,B}{4\pi^2}\right)^{1/4} \;=\; \begin{cases} 160\ MeV \;\text{ for } L_c \;=\; 0.6\ fm\;\;(B^{1/4} = 230\ MeV) \\ 125\ MeV \;\text{ for } L_c \;=\; 0.8\ fm\;\;(B^{1/4} = 180\ MeV) \end{cases} , \tag{85}$$

the characteristic mass scale of the lightest scalar glueball, given by [14]

$$m_\chi \;\equiv\; \sqrt{\left.\frac{\partial^2 V(\chi,0)}{\partial\chi^2}\right|_{\chi=\chi_0}} \;=\; 4\,\frac{\sqrt{B}}{\chi_0} \;=\; \begin{cases} 1.05\ GeV \;\text{ for } L_c \;=\; 0.6\ fm \\ 1.30\ GeV \;\text{ for } L_c \;=\; 0.8\ fm \end{cases} , \tag{86}$$

and, the estimate for the value of the gluon condensate (23),

$$G_0 \;=\; \frac{32}{9}\,B \;=\; \begin{cases} 1.25\ GeV\ fm^{-3} \;\text{ for } L_c \;=\; 0.6\ fm \\ 0.50\ GeV\ fm^{-3} \;\text{ for } L_c \;=\; 0.8\ fm \end{cases} . \tag{87}$$

The parameter values obtained above are summarized in Table 1. Both choices (79) of $B^{1/4}$ and χ_0 give reasonable results that are in the range of commonly-accepted phenomenology.

5.2 Cluster distributions and hadron spectra

Using the parametrizations of Table 1, we have investigated more quantitatively a number of typical features of the jet evolution, which we discuss now.

In Fig. 9 we show the total transverse momentum generated during the time evolution of the system in the center-of-mass of the initial jet pair:

$$p_\perp^{(\alpha)}(t) \;\equiv\; \int d^3r \int dx dp^2 dp_\perp^2\; p_\perp\; F_\alpha(t,\vec{r};x,p_\perp^2,p^2)\;, \tag{88}$$

where α labels 'partons' or 'clusters', and $p_\perp \equiv \sqrt{p_x^2+p_y^2}$. As before, we compare the cases $Q = 10$ (100) GeV and $L_c = 0.6$ (0.8) fm. At $t = 0$ we start with $p_\perp^{(\alpha)}(0) = 0$, because the two initial partons recede back-to-back along the z axis. Then, with progressing time, the jet evolution can roughly be divided into four stages: (i) a very short *hard stage* ($\lesssim 0.02$