decreases more slowly for $q\bar{q}$ pairs of different flavors than for a gg pair, because gluons have a larger emission rate and therefore the two leading gluons evaporate their initial energy faster; (ii) the crossover point between the pressures P_{qg} and P_χ is rather insensitive to the choice of L_c; (iii) the crossover is shifted away from $t = 0$ with increased jet energy Q; (iv) at L_c the partonic pressure P_{qg} still exceeds P_χ, i.e. $a_{qg}(L_c) > a_\chi(L_c)$, consistent with (81). From this analysis, we find using the determining condition (81),

$$L_c \;=\; \begin{cases} 0.6\; fm \;\;\text{for}\; B^{1/4} \;=\; 230\; MeV \\ 0.8\; fm \;\;\text{for}\; B^{1/4} \;=\; 180\; MeV \end{cases} . \tag{82}$$

Directly associated with the scale L_c is the parton-cluster conversion probability (63), which is determined by the width of the potential wall between the two phases. It enters the kinetic equations via (67) and determines locally the time scale of the parton-to-cluster transition by the magnitude of the surface tension σ_c as given by (61). We find

$$\sigma_c^{1/3} \;=\; \begin{cases} 40\; MeV \;\;\text{for}\; L_c \;=\; 0.6\; fm \;\;(B^{1/4} = 230\; MeV) \\ 48\; MeV \;\;\text{for}\; L_c \;=\; 0.8\; fm \;\;(B^{1/4} = 180\; MeV) \end{cases} , \tag{83}$$

which by virtue of (63) fixes the cluster-formation probability $\pi(L)$. It is noteworthy that the above small values of the surface tension σ_c are in agreement with lattice QCD simulations [41]. and correspond to a weakly first-order transition at finite temperature, which is consistent with astrophysical constraints [42] on inhomogenities. This finding implies a rather rapid conversion of partons into color-singlet clusters (pre-hadrons), as is also evident from Fig. 8. This means that parton-hadron conversion is not dependent on the details of the interpolation functions $\kappa_L(\chi)$ and $\mu_L(\chi)$, as already advertised in Sec. 2.3, and has interesting consequences for the cluster size and mass distribution, as we will discuss below.

The value of L_χ, below which size only the perturbative vacuum of the pure parton phase can exist, is given by the point of inflection of the effective potential $\mathcal{V}$, when the local minimum at $\langle\chi\rangle \neq 0$ ceases to exist (c.f. Fig. 2). It turns out to be rather close to L_c,

$$L_\chi \;\approx\; \begin{cases} 0.4 - 0.5\; fm \;\;\text{for}\; L_c \;=\; 0.6\; fm \;\;(B^{1/4} = 230\; MeV) \\ 0.6 - 0.7\; fm \;\;\text{for}\; L_c \;=\; 0.8\; fm \;\;(B^{1/4} = 180\; MeV) \end{cases} , \tag{84}$$

which is a consequence of the small values (83) for the surface tension σ_c, and indicates that the transition occurs very abruptly. Finally, we find that the scale L_0, when the parton-cluster conversion is complete and no partons are left over, depends not only on L_c but also