

For example, if  $\rho_s = \rho_{vW}$  in the stage of the big bang nucleosynthesis, the evolving equations (7) – (8) become

$$\begin{aligned} \dot{R}^2(t) + K &= \eta \rho_{vF} R^2(t) \\ \ddot{R}(t) &= -\frac{1}{2} \eta (\rho_{vF} + 3p_{vF}) R(t), \end{aligned}$$

This is consistent with the conventional theory.

### III. THE SORTS AND AVERAGE DENSITY OF DARK MATTER

Recent astronomical observations show that the universe expanded with a deceleration early and is expanding with an acceleration now. This implies that there is dark energy<sup>[6]</sup>.  $\rho_{de}/\rho_{tot} = 0.73$ ,  $\rho_M/\rho_{tot} = 0.27$ ,  $\rho_M = \rho_{VM} + \rho_{DM}$ ,  $\rho_{VM} \sim \rho_B$ ,  $\rho_{DM}/\rho_{tot} = 0.23$  and  $\rho_B/\rho_{tot} = 0.04$ , here  $\rho_{de}$  is the density of dark energy,  $\rho_{tot}$  is the density of the total energy of the universe ( $c = 1$ ),  $\rho_{VM}$  is the energy density of visible matter,  $\rho_{DM}$  is the energy density of dark matter, and  $\rho_B$  is the energy density of visible baryon matter. According to the cosmological model without singularity<sup>[5]</sup>, in the  $V - breaking$ , the effects of  $s - matter$  are equivalent to that of the so-called dark energy, and  $\rho_v = \rho_M$ . According to this dark-matter model [3, 4], because of the symmetry of  $F - matter$  and  $W - matter$ , we have

$$\begin{aligned} \rho_M &= \rho_v = \rho_{vF} + \rho_{vW} = 2\rho_{vF}, \quad \rho_B = \rho_{vFB}, \\ \rho_{vF} &= \rho_{vFB} + \rho_{vFu}, \quad \rho_{vW} = \rho_{vWB} + \rho_{vWu}, \\ \rho_{vFB} &= \rho_{vWB}, \quad \rho_{vFu} = \rho_{vWu}, \quad \rho_{vD} = \rho_{vFu} + \rho_{vW} = \rho_{DM}, \end{aligned} \tag{9}$$

where  $\rho_v$  is the total energy density of  $v - matter$ ,  $\rho_{vF}$  and  $\rho_{vW}$  are respectively the energy density of  $v - F - matter$  and the energy density of  $v - W - matter$ ,  $\rho_{vFB}$  and  $\rho_{vWB}$  are respectively the energy density of  $v - F - baryon$  matter ( $v - FBM$ ) and the energy density of  $v - W - baryon$  matter ( $v - WBM$ ),  $\rho_{vFu}$  is the energy density of unknown  $v - F - matter$  ( $v - UFM$ ),  $\rho_{vWu}$  is the energy density of  $v - W - matter$  ( $v - UWM$ ) corresponding to  $v - UFM$ , and  $\rho_{vD}$  is the total energy density of invisible  $v - matter$ . Here  $v - FBM$  is the given and visible matter which contains given baryon matter, black holes and neutrinos etc.,  $F - matter$  contains  $v - FBM$  and invisible and unknown  $v - UFM$ . Considering  $\rho_{vF} = \rho_{vW}$  because  $F - matter$  and  $W - matter$  are symmetric and can transform from one into another when temperature is high enough, we can determine the ratios of a density to another.