**Fig. 5** The evolution of the eigenfrequency of the coupled oscillators; **(a)** the evolution of the two eigenvalues of the coupled oscillators with the change of the resonant frequency difference of the two oscillators for the case  ; **(b)** the symmetrical anti-cross evolution of the eigenfrequencies of the coupled oscillators for the case and ; **(c)** the symmetric evolution of the eigenfrequencies of the coupled oscillators for the case.