



Figure 11 CO_2 residual volume versus down boundary CO_2 flux.

ulation. These results show that in the injection period the dominating effect is related to aggradation, while at end of simulation the most influential feature is the fault criteria. During injection, the flow is dictated by the viscous force imposed by the injector. This force is more sensitive to the feature. In the low aggradation cases, flow is forced to stay in the lower layers with lower permeability values. This increase the pressure in the aquifer. In the higher aggradation level, CO_2 can flow upward through channels with higher permeabilities. This lowers the average pressure in the domain. This is why the gradient is negative for aggradation at end of injection, since lower aggradation level introduces higher pressure.

After stopping the injection, the dominating force is the gravity. The main flow direction is vertical and the pressure is now more sensitive to fault criteria. This is what we see in Fig. 12(b).

The effect of progradation switches from positive to negative after stopping the injection. During injection period, injecting in up-dip direction is easier than injecting in down-dip direction, while for the plume migration after injection the down-dip opens more conductive medium in front of the plumes moving towards the crest.

In Fig. 13 plume number sensitivity is shown. During injection (Fig. 13(a)), barriers are the most influential features. They enhance the lateral flow and the plume splits rather than accumulating in the crest. At end of simulation (Fig. 13(b)), progradation plays an important role relatively. Note that at this time, the open faults are introducing large number of plumes, while the unfaulted and closed faulted cases introduce small number of plumes which in average cancels out to a low gradient.

Finally Fig. 14 shows gradients for total CO_2 residuals. During injection (Fig. 14(a)) aggradation is the most influential feature. Fault criteria is playing the most important role in the plume migration period after injection (Fig. 14(b)).