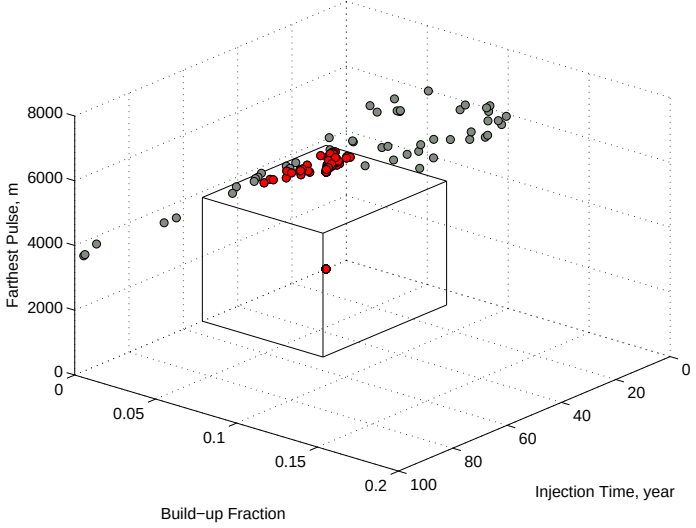

Figure 15: Pressure criteria implemented to filter the acceptable cases. Cases below the critical limits are plotted in red and cases exceeding the limits are plotted in gray.

average of these layers. If any of these layers contains a low permeability rock, this will result in a low vertical permeability. Injecting into a limited space sealed vertically, increases the pressure in the injection point.

Progradation direction can dominate the pressure behavior. It is very important to locate the injector in a high permeability zone is connected to other parts of the domain via permeable channels. Injecting into the river side of a shallow-marine depositional system, may end up into locating the injection point in a low quality rock between river branches joining the sea. This rises the pressure significantly near the injection point and can result in a high well-bore and aquifer pressure.

Structural deformations due to faulting process can increase the connectivity in the medium. If the transmissibity in the aquifer scale is high, the injection pressure releases through the open boundaries. However, if the injection area is surrounded by low quality medium, the pressure rises in the aquifer and the connectivity enhanced by fault geometries spread the build-up region in the domain. On the other hand, sealing faults result in high pressure within closed zones around the injection point. However, they may limit the pressure disturbance propagation in the domain.

From an operational perspective, pressure limits must be set to keep the operations within safe margins. One approach to study the safety of an operation could be setting critical limits on the pressure responses measured here. This limit is used to filter cases with desirable/acceptable pressure behavior. The critical margins are inferred from the realistic operational requirments. In our pracice, we assume these margins to be 53 years for the injection time, 0.0787 for the pressurised volume fraction, 0.0745 for the build-up volume fraction, and 3822 m for the farthest pulse distance from the injection point. These values are picked from the middle points of range of variations in the results. By these assumptions, 49 cases out of total number of 160 cases exceed the critical limits.

Figure 15 shows the cases filtered by the pressure criteria. In Figure 15, the pressurized volume fraction is also considered in the filtration, though it is not shown in the plot axes.