better results while for large $d$ the ED with the $OR$ fusion rule is the best option.

Finally, Figs. 6-9 show snapshots of the coverage of the different detectors for the specified values of $d$ for the test scenario displayed in Fig. 4. There are several things to notice from these plots that are consistent with the analysis in Section IV: 1. When the sensor nodes are very close to each other (see Fig. 6), the coverage area for all detectors is a circle around the location of the sensor nodes. For this case the hybrid detector ECD has the best coverage followed by CD that essentially achieves the optimal performance (OD). It is also interesting to note that for this case, ED($AND$) achieves slightly better coverage than ED($OR$). 2. As the separation distance between the two sensor nodes is increased (see Fig. 7-8), the coverage area of the CD becomes an ellipse around the sensor nodes’ locations and looks very similar to the one of ED($OR$)- this explains the motivation behind using the ECD. Please note that while the coverage area of the OD and the ED($OR$) increases, the coverage area of all other detectors decreases since they depend on either covariance information -CD, ECD-, or simultaneous detection by the two sensor nodes- ED($AND$). 3. When the sensor nodes are sufficiently apart (see Fig. 9) the optimal coverage area becomes two circles around the individual sensor nodes’ positions. This is closely resembled by ED($OR$) which achieves the best coverage out of the distributed detectors. The other detectors do not perform well for this case- this is expected because their performance is based on closely spaced sensor nodes.

Fig. 6. Detection snapshots between 2 sensor nodes separated by $d=1$m