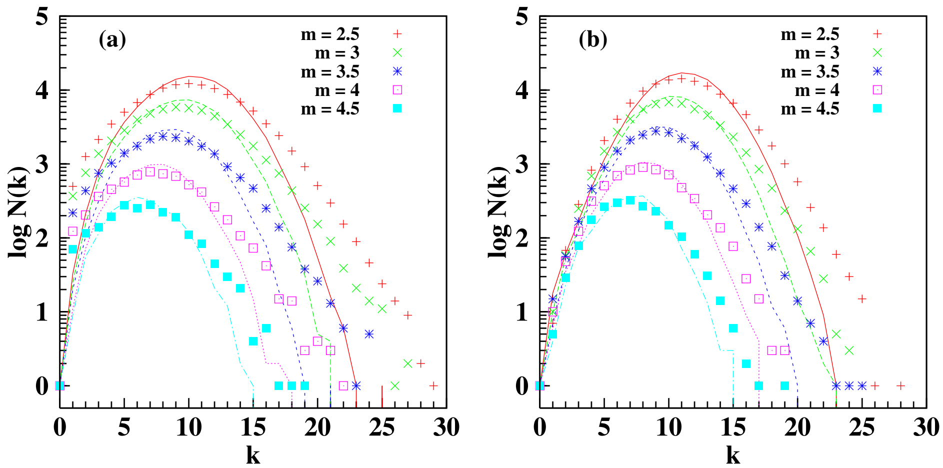
FIG. 2: The panels (a) and (b) in the figure represent the degree distributions for the actual and the shuffled catalogs respectively. The points represent the out-degree and lines of the same colour as the points represent the corressponding in-degree distributions for the different m_{th} values shown in the legend of the graph. The in-degree, for all m_{th} values is almost a Poisson distribution for both the actual and the shuffled catalogs. The out-degree of the actual catalog shows significant deviations from Poisson behaviour for low and higher degree values. In case of the shuffled catalog, the marginal deviation from Poisson behaviour is only towards the higher degree values.



distributions of the actual network especially for the lower degree values. For each network, the mean in-degree is equal to the mean out-degree. As expected, this decreases with m_{th} because the number of nodes and therefore, the number of links decrease with m_{th}. For a Poisson distribution, it is expected that $\langle k \rangle \approx \log N$, which is what we observe in Fig. 3 for the shuffled catalog. For the actual catalog however, the number of links are less than that of a random network and we get $\langle k \rangle \approx 0.91 \log N$. The value 0.91 is higher than that reported for California in [10] and this means that larger number of links are possible for the nodes in the Japanese seismic network.

B. Distance distributions

We use the great circle distance for computing the distance l_{ij} between two event locations. This is calculated using the Haversine formula [12]: if (ϕ_i, λ_i) and (ϕ_j, λ_j) are the (latitude, longitude) values for the two event locations and, $\Delta\phi = \phi_j - \phi_i$ and $\Delta\lambda = \lambda_i - \lambda_j$, then

$$l_{ij} = R\Delta\sigma$$