As PMS contraction progresses, the core temperature of a fully convective star increases to the point at which Li is burned in $p,\alpha$ reactions. The time taken to reach this temperature is longer for lower masses and hence the luminosity at which Li burning runs to completion is also age dependent. In a cluster of coeval stars, we expect to see very low-luminosity objects that retain all their initial lithium. This point is known as the lithium depletion boundary (LDB). The plot on the right shows how different evolutionary models predict a very similar relationship between luminosity at the LDB and age.

Note that higher mass stars (>0.6Msun) can also retain Li, if a radiative core pushes out before PMS burning begins or is complete; but at ages >10 Myr there will be a gap centred on 0.4Msun where no Li is present – here we are interested in the cool, low luminosity edge of this gap.