

In his book Sumner computes the local hour angle, LHA, and hence longitude using the formula

$$1 - \cos \text{LHA} = 2 \text{hav}(\text{LHA}) = [\cos(L - \delta) - \sin h] \sec L \sec \delta$$

for given latitude,  $L$ , observed altitude,  $h$ , and declination,  $\delta$  and calls it the “rising”.

Worsley is using the equivalent form

$$\text{hav}(\text{LHA}) = \cos \frac{S}{2} \sin \left( \frac{S}{2} - h \right) \sec L \csc(\text{p.d.})$$

where the polar distance  $\text{p.d.} = 90^\circ + \delta$  for southern latitudes and  $S = h + L + \text{p.d.}$

What approach does Nicholl’s guide give for computing the LHA?