Claim cont

LHS $\quad \mathbb{E}\left[\chi(\text{Vox}(A))\right] = \sum_{j=0}^{3} \mathcal{L}_j(A) \, p_j(u)$

and $\quad \mathbb{E}\left[\chi(\text{Vox}(B))\right] = \sum_{j=0}^{3} \mathcal{L}_j(B) \, p_j(u)$

combining all & applying the proposition we see that:

$$\mathcal{L}_1(A \,\dot{\cup}\, B) \, p_j(u) = \left(\mathcal{L}_j(A) + \mathcal{L}_j(B)\right) p_j(u)$$

$$\forall u \implies \mathcal{L}_1(A \,\dot{\cup}\, B) = \mathcal{L}_1(A) + \mathcal{L}_1(B).$$

□

Could use 12.4.3 for a better estimate
of the $\mathcal{L}_1$ on the "inner boxes"

i.e the ones without boundary

Now divide the voxel manifold
into lots of boxes.

) For generalization of the
locally stationary
approximation to general
manifolds, ask Fabian.