

$$\phi_u \circ \varphi_u$$

$$\phi_v \circ \varphi_v \circ \rho_{uv} = \phi_v \circ \rho'_{uv} \circ \varphi_u = \phi_u \circ \varphi_u$$

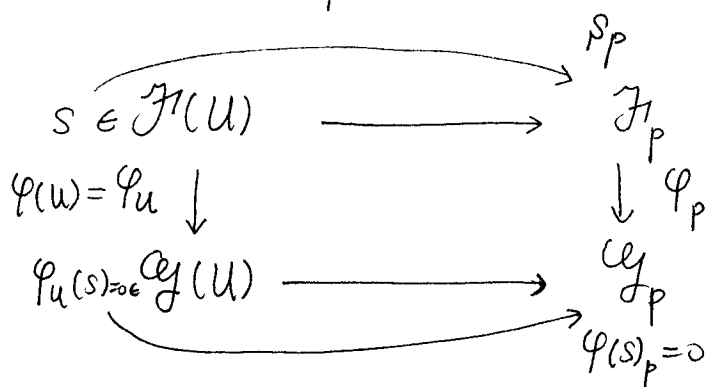
$\Rightarrow \exists \varphi_p: \mathcal{F}_p \rightarrow \mathcal{G}_p$  by the property of a direct system, see M. Greenberg, p209~p210, for more details.

pf). ( $\Rightarrow$ ) Trivial. since  $\varphi_u$  is isomorphic for each  $U$ .

( $\Leftarrow$ ). Sufficient to show that  $\varphi_u: \mathcal{F}(U) \rightarrow \mathcal{G}(U)$  is an isomorphism. since we can define an inverse morphism  $\psi$  by  $\psi(U) = \varphi(U)^{-1}$  for each  $U$ .

①  $\varphi(U)$  is injective.

$s \in \mathcal{F}(U)$  s.t.  $\varphi(U)(s) = 0$  in  $\mathcal{G}(U)$ ,  $\Rightarrow$  for every point  $p \in U$ , the image  $\varphi(s)_p$  of  $\varphi(s)$  in the stalk  $\mathcal{G}_p$  is 0.



Since  $\varphi_p$  is injective for each  $p$ , we deduce  $s_p = 0$  in  $\mathcal{F}_p$  for each  $p \in U$ .

\* To say that  $s_p = 0$  means that  $s = 0$  on  $W_p \subset U$  where  $W_p$  is an open nbd of  $p$ .