$$\Rightarrow \psi'' - \frac{\psi''(u')_{-1}}{u_K} = \sum_{\nu=-N}^{-2} \psi''(u')_\nu u_K^\nu + \sum_{\nu=0}^{\infty} \psi''(u')_\nu u_K^\nu$$

$$= \frac{\partial}{\partial u_K}\left(\sum_{\nu=-N}^{-2} \psi''(u')_\nu \frac{u_K^{\nu+1}}{\nu+1} + \sum_{\nu=0}^{\infty} \psi''(u')_\nu \frac{u_K^{\nu+1}}{\nu+1} \right)$$

$$\eta = \sum_{\nu=-N}^{-2} \psi''(u')_\nu \frac{u_K^{\nu+1}}{\nu+1} + \sum_{\nu=0}^{\infty} \psi''(u')_\nu \frac{u_K^{\nu+1}}{\nu+1}$$

$\Rightarrow$ η has one less order pole than ψ'' in u_K and η has the same order pole in u'.

If $K = 1$, $u' = (u_0)$. $\Rightarrow$ Since $H^q(\Delta^n, \Omega^p) = 0$, $q > 0$,
$H^*(M, \mathbb{C}) \cong H^*_{DR}(M, hol)$.
$\Rightarrow$ The theorem is valid, i.e. φ closed holomorph. p-form on Δ^n, $\Rightarrow \exists$ η holo. s.t $\varphi = d\eta$.
$\Rightarrow$ By induction, we prove the theorem for $u' = (u_1)$
..... done.

"Comment on K where $\varphi = \psi' + \psi'' \wedge du_K$.

Don't be confused with K in $P^*(k, n)$."

Clearly,
$$\tilde{\varphi} = \varphi - d\eta = \xi' + \xi'' \wedge \frac{du_K}{u_K},$$
where $\xi'' \equiv 0\,(u', du')$ and $\xi' \equiv 0\,(du')$.

Γ $\eta = \eta_I \, du_I$. $\quad I \subset \{1, 2, \cdots K-1\}$.

$$d\eta = \frac{\partial \eta_I}{\partial u_K} du_K \wedge du_I + \frac{\partial \eta_I}{\partial u_j} du_j \wedge du_I. \qquad j = 1, \cdots K-1.$$

$$\varphi - d\eta = \psi' + \psi'' \wedge du_K - d\eta$$