Bad pair (N, P), $N \lhd M$ compared via (Λ_N, Σ_P)

Comparison defined in stages. $(\mathcal{T}, \mathcal{U}) \restriction \delta_\alpha + 1$, $\alpha < \omega_1$.

Given $(\mathcal{T}, \mathcal{U}) \restriction \delta_\alpha + 1$ $\delta_\alpha = \delta(\mathcal{T} \restriction \delta_\alpha)$

$Q = Q(\mathcal{T} \restriction \delta_\alpha, b)$

$Q' = Q(\mathcal{U} \restriction \delta_\alpha, c)$

$Q \neq Q'$

For $(\mathcal{T}, \mathcal{U}) \restriction [\delta_\alpha, \delta_{\alpha+1})$: 2 stages:

Comparison with M-genericity iteration + linear part $(\mathcal{T}, \mathcal{U}) \restriction (\delta_\alpha + 1)$

Q-structures agree every limit step $< \delta_{\alpha+1}$.

$\delta_{\alpha+1} = \delta((\mathcal{T}, \mathcal{U}) \restriction \lambda)$ when λ least such that

$Q(\mathcal{T} \restriction \lambda, b) \neq Q(\mathcal{U} \restriction \lambda, c)$

$\uparrow$

$\Sigma_P(\mathcal{U} \restriction \lambda)$

$\mathcal{T} \restriction \delta_{\alpha+1}$ is well-defined b/c $(\mathcal{T}, \mathcal{U}) \restriction \delta_{\alpha+1}$ is defined over $M | \delta_{\alpha+1}$ from the parameter $(\mathcal{T}, \mathcal{U}) \restriction \delta_{\alpha+1}$ and using $E^{M | \delta_{\alpha+1}}$ to compute Q-structures according to Λ_N.

The comparison lasts ω_1 stages. Get model $\mathcal{M}(\mathcal{T}, \mathcal{U})$ of height ω_1. In M not both $\mathcal{T}, \mathcal{U}$ have branches.

This means that $\mathcal{M}(\mathcal{T}, \mathcal{U})$ has boundedly many Woodins as M is tame. So there must be some α s.t. δ_α is largest defined. After stage α, the Q-structures always agree.

So let $\lambda > \delta_\alpha$ be limit. Then

$$Q \trianglelefteq M^{\mathcal{T}}_\lambda \Rightarrow Q \triangleleft M^{\mathcal{T}}_\alpha$$
$$Q \trianglelefteq M^{\mathcal{U}}_\lambda \Rightarrow Q \triangleleft M^{\mathcal{U}}_\alpha$$

Let (N_1, P_1) be bad with $\delta_\alpha < \omega_1^{N_1} = \omega_1^{P_1}$

So $\lambda = \omega_1^{N_1}$ is limit stage of comparison.

~~Q, Q~~ $Q^* = N_1$. Why: $Q^* \notin N_1$, o.w. in N_1 we get branches ~~from~~ Q (and $Q \in N_1$).

Trees $\mathcal{T}'$ on Q above δ ≈ trees $(\mathcal{T}')^*$ on Q^* on N_1.

Now compare N_1, P_1 as for (N, P) defining $(\mathcal{T}_1, \mathcal{U}_1)$. Note that when viewing as trees on (N_1, P_1) the tree drops ~~at δ~~ as it is based on Q.

This way we inductively define trees $(\mathcal{T}_n, \mathcal{U}_n)$. Their composition then constitutes a normal tree on N_0 with a branch with infinitely many drops.