

# Auxiliary Materials for

## Evaluation of Factors Controlling Global Secondary Organic Aerosol Production from Cloud Processes

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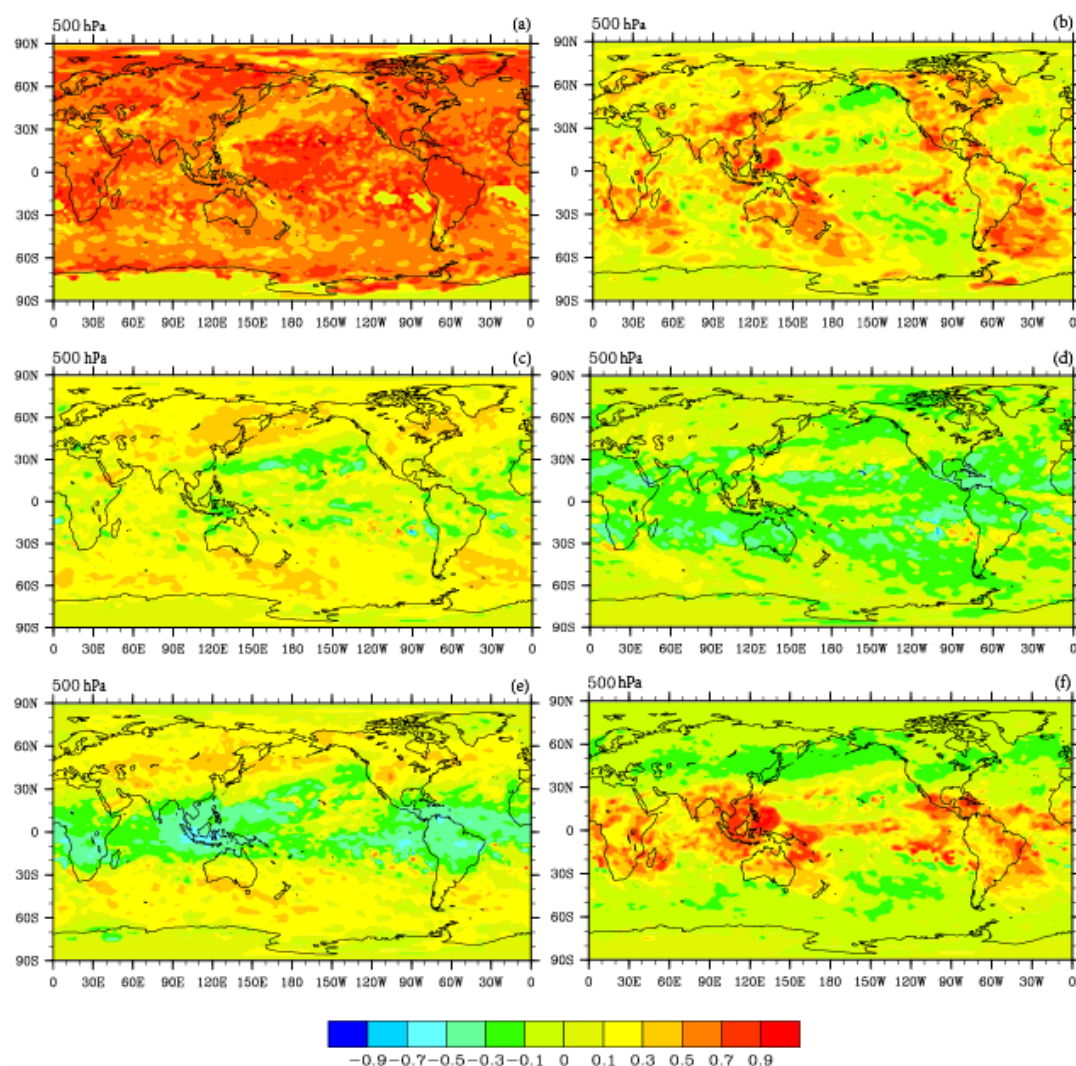


Figure S1. Distribution of the correlation ( $r$ ) between  $\text{SOA}_{\text{clld}}$  production and (a) LWC, (b)  $\text{TC}_{\text{loss}}$ , (c) temperature, (d)  $\text{O}_3$ , (e) OH, (f) VOC/NO<sub>x</sub> at 500hPa

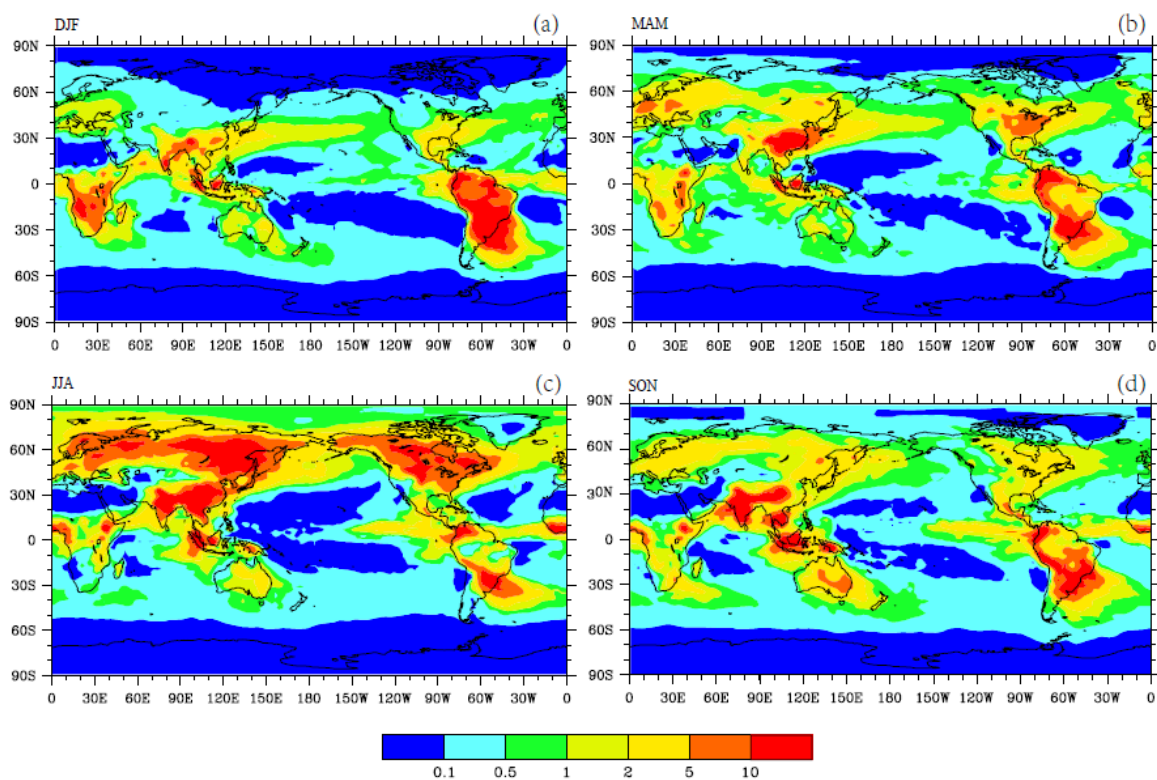


Figure S2. Process-based seasonal averaged column production of  $\text{SOA}_{\text{cl}}$  in DJF, MAM, JJA, and SON (unit:  $\text{ng}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$ )

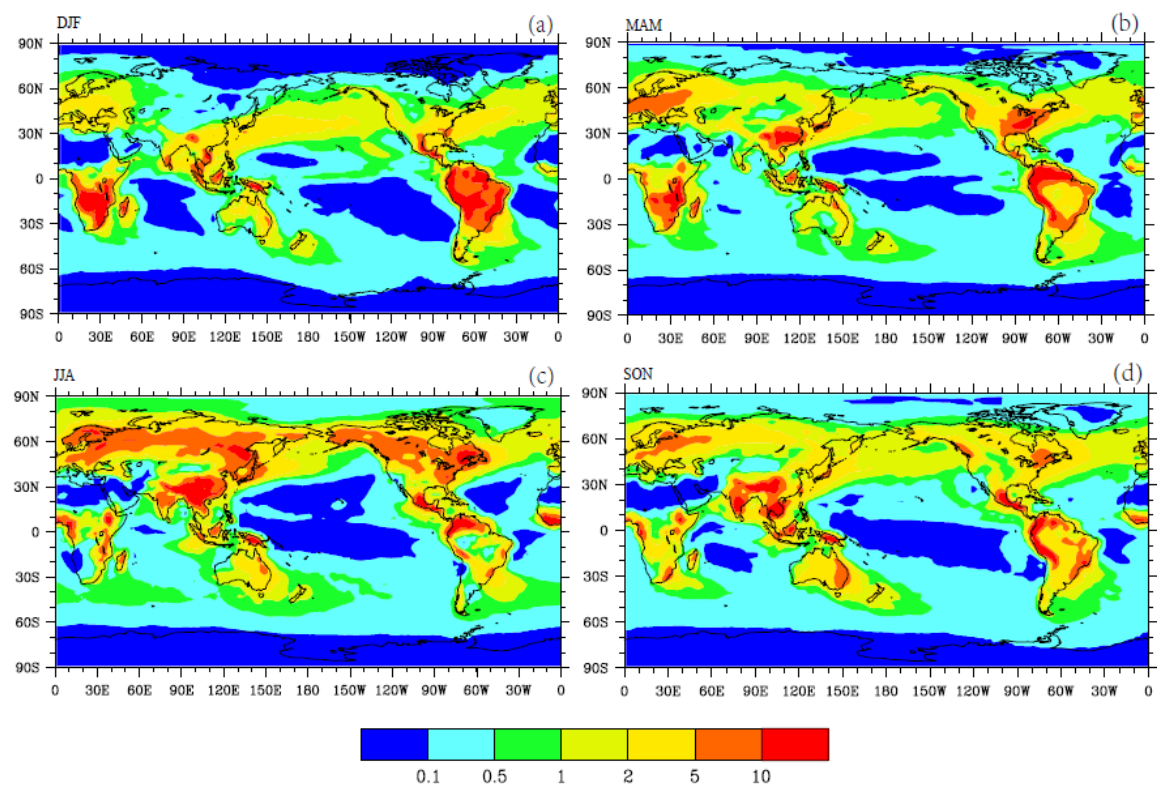


Figure S3. Parameterized seasonal averaged column production of  $\text{SOA}_{\text{cl}}$  in DJF, MAM, JJA, and SON (unit:  $\text{ng}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$ )

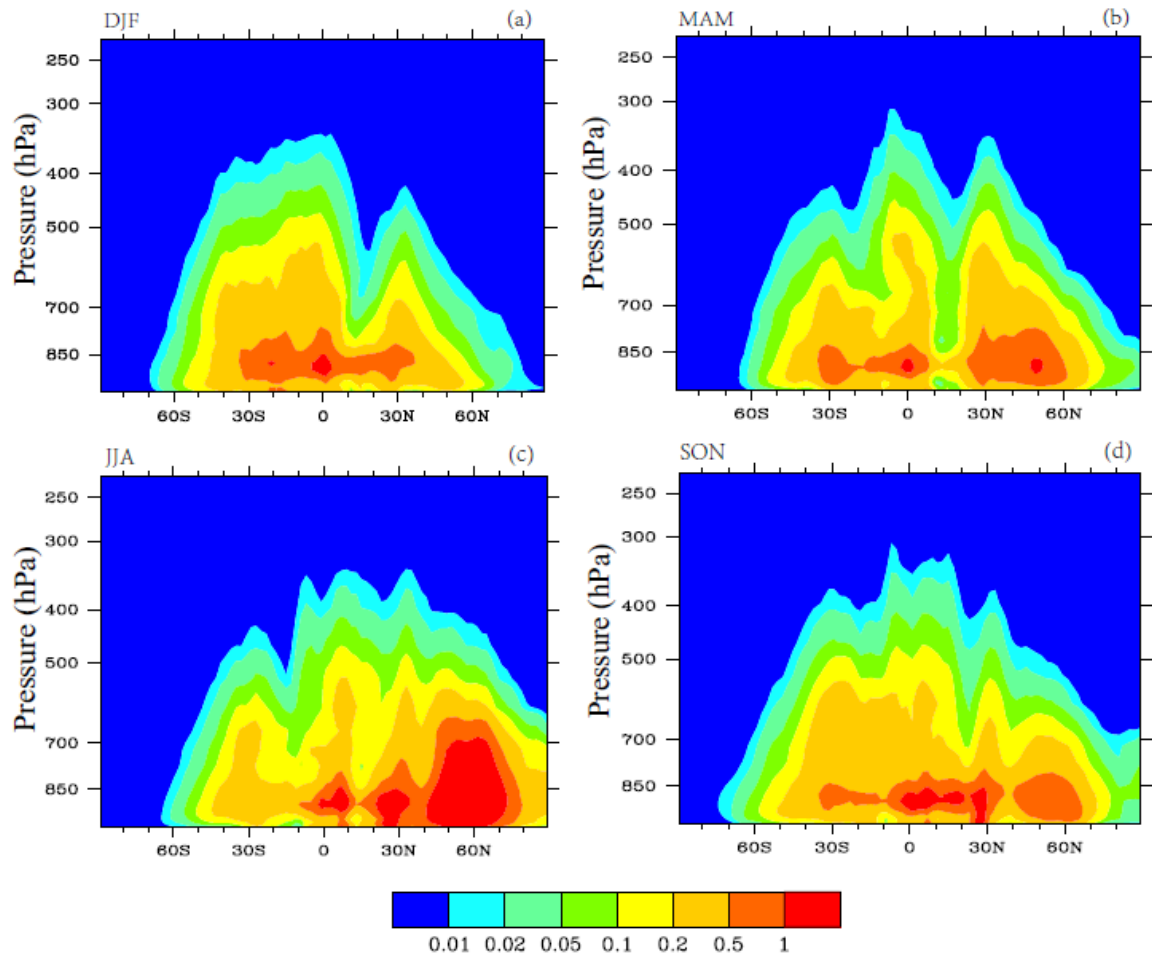


Figure S4. Process-based seasonal averaged zonal mean production of  $\text{SOA}_{\text{cld}}$  in DJF, MAM, JJA, and SON (unit:  $\text{pg}\cdot\text{m}^{-3}\cdot\text{s}^{-1}$ )

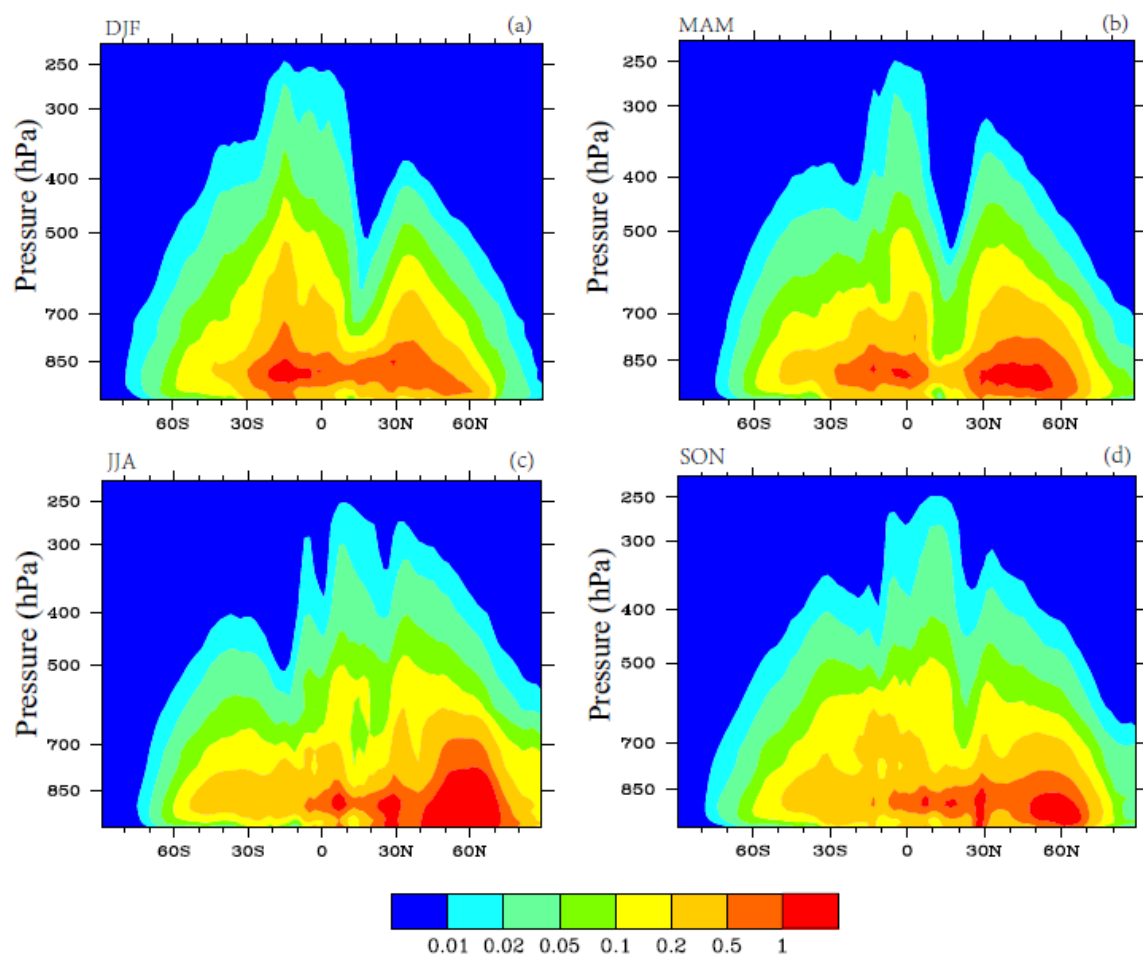


Figure S5. Parameterized seasonal averaged zonal mean production of  $\text{SOA}_{\text{cl}}$  in DJF, MAM, JJA, and SON (unit:  $\text{pg}\cdot\text{m}^{-3}\cdot\text{s}^{-1}$ )

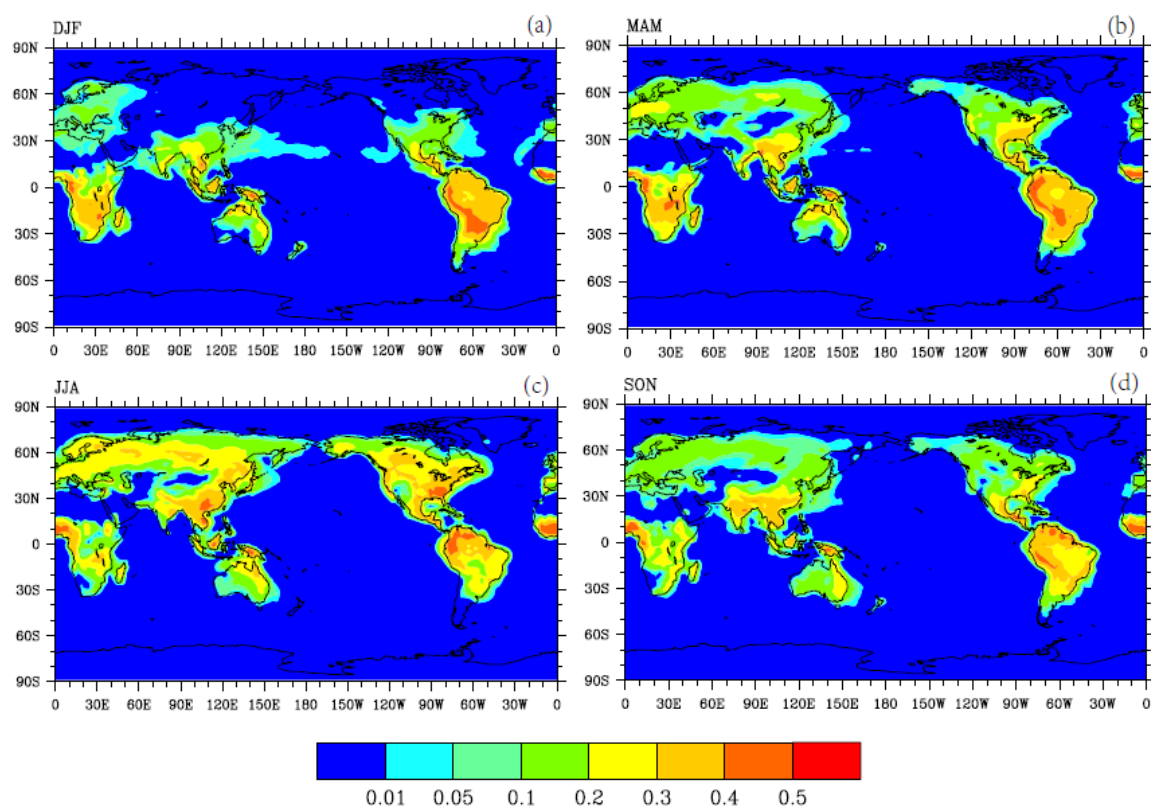


Figure S6. Relative change of seasonal averaged column production of  $\text{SOA}_{\text{cld}}$  as a result of 20% increase in parameter  $\gamma$

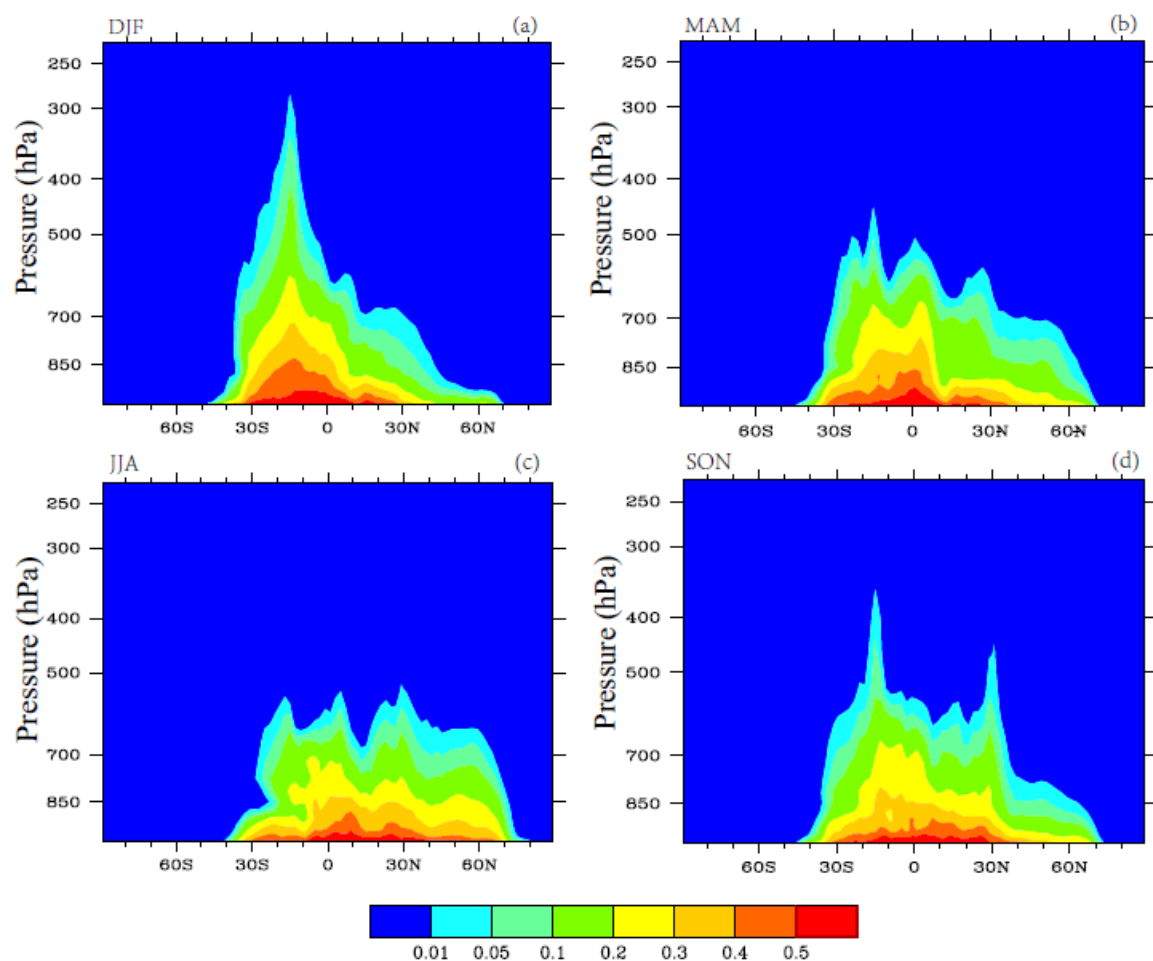


Figure S7. Relative change of seasonal averaged zonal mean production of  $\text{SOA}_{\text{cld}}$  as a result of 20% increase in parameter  $\gamma$