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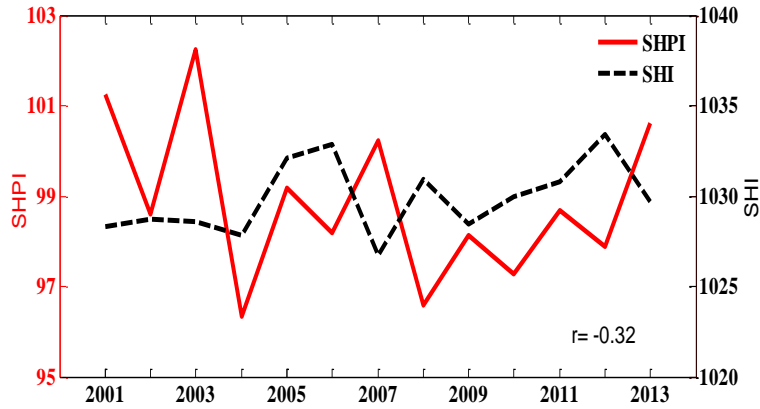
## **A new indicator on the impact of large-scale circulation on wintertime particulate matter pollution over China**

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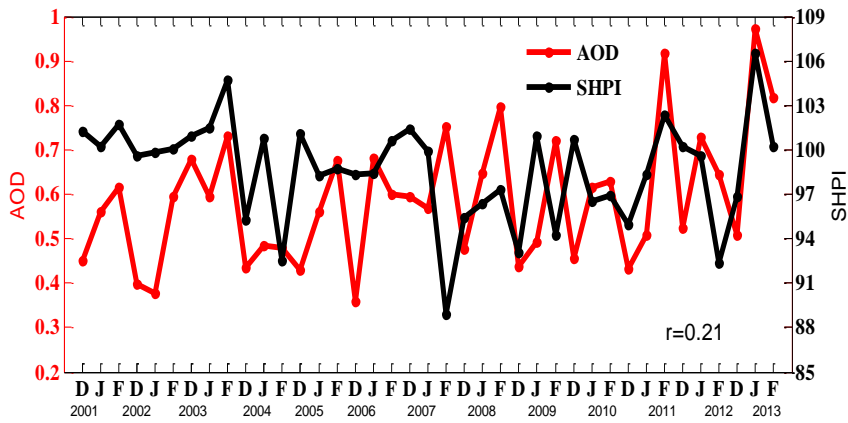
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1 **Supplementary**



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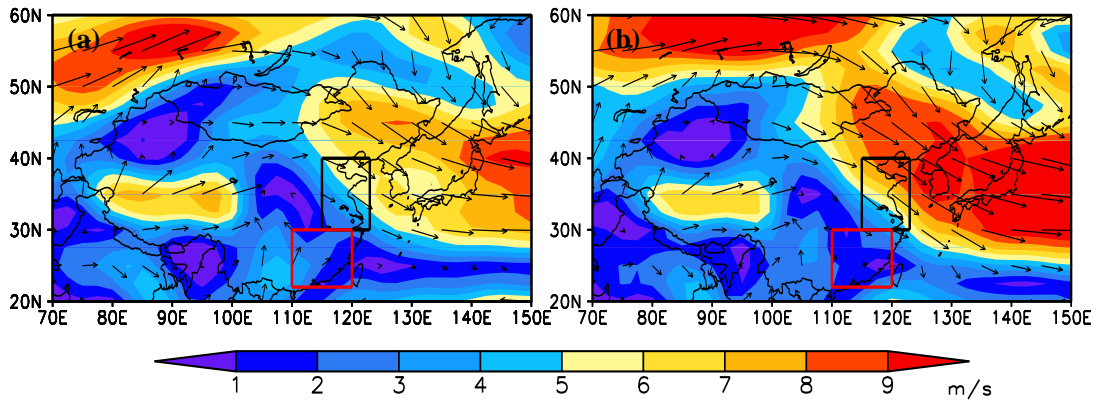
3 Figure S1. Time series of SHPI ( $^{\circ}$ ) and SHI (hPa) from 2001 to 2013.



4

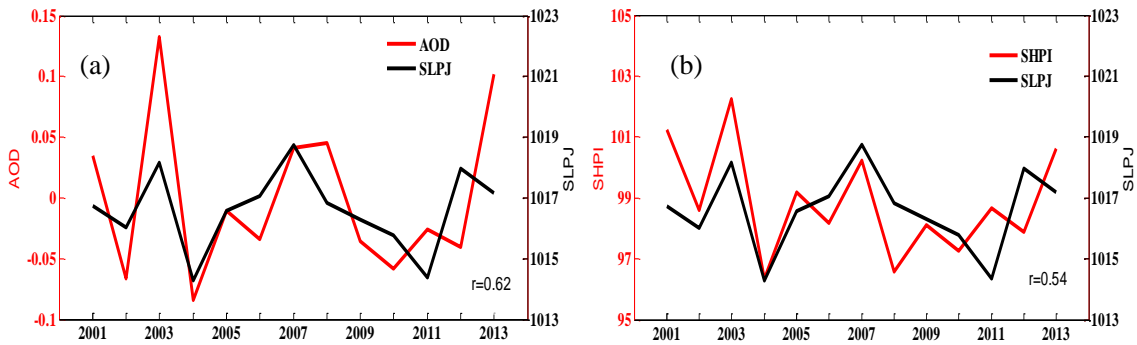
5 Figure S2. Time series of NC AOD and SHPI ( $^{\circ}$ ) for winter months from December  
6 2001 to February 2013. The data are raw time series prior to detrending and  
7 normalization.

8

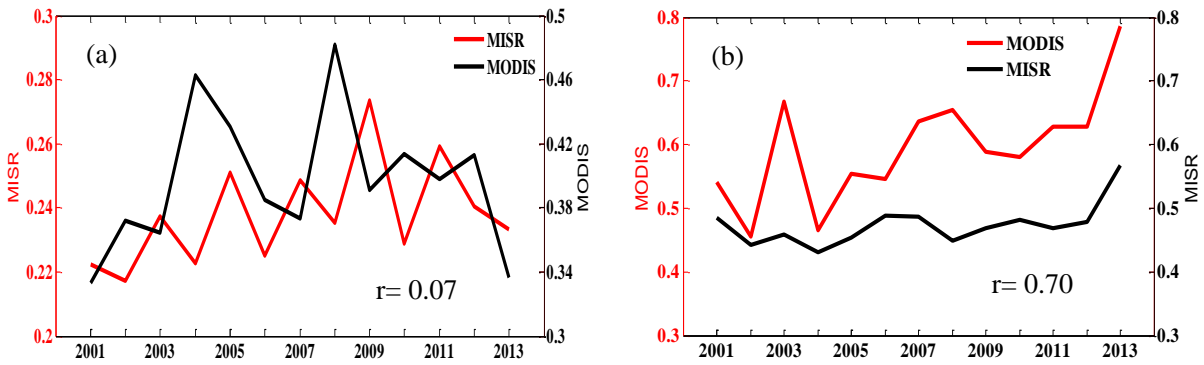


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10 Figure S3. Spatial distribution of wintertime 850hPa wind field (vector), and wind  
 11 speed ( $\text{m s}^{-1}$ , shaded) in (a) 1990 and (b) 2004.

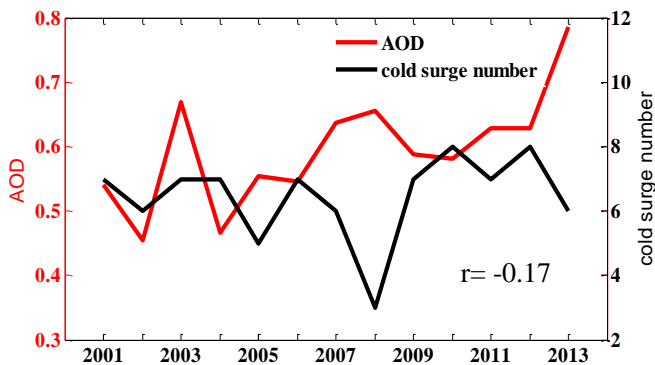


12  
 13 Figure S4. Time series of SLP (hPa) over Japan (SLPJ) with (a) detrended NC AOD  
 14 and (b) SHPI ( $^{\circ}$ ) from 2001 to 2013.



15  
 16 Figure S5. Time series of MISR AOD and MODIS AOD during 2001-2013 over (a)  
 17 South China and (b) North China.

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19

20 Figure S6. Time series of MODIS AOD over NC and cold air surge number from

21 2001 to 2013.