Vol. 39 NO. 8 August 2022

## CONTENTS

## **EDITORIAL NOTES**

1207 Preface to the Special Issue on Carbon Neutrality: Important Roles of Renewable Energies, Carbon Sinks, NETs, and non-CO<sub>2</sub> GHGs

Junji CAO, Ning ZENG, Yi LIU, Bengang LI, and Pengfei HAN

### **NEWS & VIEWS**

1209 COP26: Progress, Challenges, and Outlook

Yi WANG, Yuxuan LIU, and Baihe GU

## **PERSPECTIVES**

1217 Climate Warming Mitigation from Nationally Determined Contributions

Bo FU, Jingyi LI, Thomas GASSER, Philippe CIAIS, Shilong PIAO, Shu TAO, Guofeng SHEN, Yuqin LAI, Luchao HAN, and Bengang LI

1229 The Chinese Carbon-Neutral Goal: Challenges and Prospects

Ning ZENG, Kejun JIANG, Pengfei HAN, Zeke HAUSFATHER, Junji CAO, Daniel KIRK-DAVIDOFF, Shaukat ALI, and Sheng ZHOU

#### **REVIEW**

1239 A Concise Overview on Solar Resource Assessment and Forecasting

Dazhi YANG, Wenting WANG, and Xiang'ao XIA

1252 Frontiers of CO<sub>2</sub> Capture and Utilization (CCU) towards Carbon Neutrality

Lingyun ZHANG, Yanfang SONG, Jialin SHI, Qun SHEN, Deng HU, Qiang GAO, Wei CHEN, Kien-Woh KOW, Chengheng PANG, Nannan SUN, and Wei WEI

#### **ORIGINAL PAPERS**

1271 The Variability of Air-sea O<sub>2</sub> Flux in CMIP6: Implications for Estimating Terrestrial and Oceanic Carbon Sinks

Changyu LI, Jianping HUANG, Lei DING, Yu REN, Linli AN, Xiaoyue LIU, and Jiping HUANG

1285 Changes in Global Vegetation Distribution and Carbon Fluxes in Response to Global Warming:
Simulated Results from IAP-DGVM in CAS-ESM2

Xiaofei GAO, Jiawen ZHU, Xiaodong ZENG, Minghua ZHANG, Yongjiu DAI, Duoying JI, and He ZHANG

1299 Characterization of Regional Combustion Efficiency using ΔΧCO: ΔΧCO<sub>2</sub> Observed by a Portable Fourier-Transform Spectrometer at an Urban Site in Beijing

Ke CHE, Yi LIU, Zhaonan CAI, Dongxu YANG, Haibo WANG, Denghui JI, Yang YANG, and Pucai WANG

1316 Fengyun-4 Geostationary Satellite-Based Solar Energy Nowcasting System and Its Application in North

China
Chunlin HUANG, Hongrong SHI, Ling GAO, Mengqi LIU, Qixiang CHEN, Disong FU, Shu WANG, Yuan YUAN,

and Xiang'ao XIA

1329 Ocean-atmosphere Teleconnections Play a Key Role in the Interannual Variability of Seasonal Gross
Primary Production in China

Kairan YING, Jing PENG, Li DAN, and Xiaogu ZHENG

1343 Decadal Methane Emission Trend Inferred from Proxy GOSAT XCH<sub>4</sub> Retrievals: Impacts of Transport Model Spatial Resolution

Sihong ZHU, Liang FENG, Yi LIU, Jing WANG, and Dongxu YANG

1360 Effects of Plant Community Type on Soil Methane Flux in Semiarid Loess Hilly Region, Central Gansu Province, China

Chuanjie YANG, Guang LI, Lijuan YAN, Weiwei MA, Jiangqi WU, Yan TAN, Shuainan LIU, and Shikang ZHANG

1375 The Synergism between Methanogens and Methanotrophs and the Nature of their Contributions to the Seasonal Variation of Methane Fluxes in a Wetland: The Case of Dajiuhu Subalpine Peatland Luwen WANG, Jiwen GE, Liang FENG, Yaoyao LIU, Yu LI, Jiumei WANG, Xiang XIAO, and Zhiqi ZHANG

# On the cover

For China to achieve its carbon neutrality goal before 2060, a complete, but complementary (Yin-Yang) transformation from fossil fuels (bottom panel) to renewable energy (solar and wind, upper panel) must occur. Scientists believe this is attainable by promoting carbon sinks within ecosystems, such as planting trees, which will provide biodiverse habitats in the future (The inset picture in the "non-fossil" labeled section shows a golden monkey family that lives in the Shennongjia Biosphere Reserve). The special issue: "Carbon Neutrality: Important Roles of Renewable Energies, Carbon Sinks, NETs, and non-CO2 GHGs" provides highlights from carbon neutrality research.