

## **Revisiting the Long-range Transboundary Black Carbon: The Role of International Trade and Atmospheric Transport**

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Black carbon (BC), emitted mainly from combustion processes, both owns a large warming potential to global climate and poses a great threat on human health. Though long-range atmospheric transport of BC has been extensively studies, little is known about BC redistribution via international trade. Here, for the first time, we evaluated the virtual BC transport based on a multi-region input-output (MRIO) analysis, and compared which to long-range atmospheric transport of BC using the Model for Ozone and Related Chemical Tracers (MOZART-4). We build the global BC emission inventory with high sectoral resolution, and use the MRIO table derived from the Version 9 of GTAP database to quantify the virtual transport of BC. We also improve the MOZART4 by considering the different aging time of BC across the world regions. We use tag technology to evaluate the long-range transport of BC. A deeper understanding of the direct and indirect long-range transport provides valuable insights with respect to mitigating long-range transboundary air pollution (LRTAP) and prompts concerted efforts aiming at more environmentally conscious globalization.