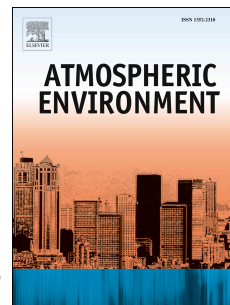


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The chemical composition and fluxes of atmospheric wet deposition at four sites in South Africa

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Abstract

South Africa is the economic hub of southern Africa and is regarded as an important source region of atmospheric pollutants. A nitrogen dioxide (NO₂) hotspot is clearly visible from space over the South African Mpumalanga Highveld, while South Africa is also regarded as the 9th largest anthropogenic sulphur (S) emitting country. Notwithstanding the importance of South Africa with regard to nitrogen (N) and S emissions, very limited data has been published on the chemical composition of wet deposition for this region. This paper presents the concentrations of sodium (Na⁺), ammonium (NH₄⁺), potassium (K⁺), calcium (Ca²⁺), magnesium (Mg²⁺), nitrate (NO₃⁻), chloride (Cl⁻), sulphate (SO₄²⁻) and water-soluble organic acids (OA) in the wet deposition samples collected between 2009 and 2014 at four South African IDAF (IGAC DEBITS Africa) sites, which are regarded as regional representatives of the north-eastern interior. Also, wet deposition fluxes of the ten ions are calculated and presented in this paper. The results show that the total ionic concentrations and fluxes of wet deposition were much higher at the two sites closer to anthropogenic emissions, while the pH of wet deposition at these

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