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Assessing the Contribution of Data Mining Methods to Avoid Aircraft Run-Off from the Runway to Increase the Safety and Reduce the Negative Environmental Impacts

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Abstract

The Single Europe Sky Air Traffic Management Research (SESAR) program develops and implements innovative technological and operational solutions to modernize European air traffic management and to eliminate the negative environmental impacts of aviation activity. This article presents our developments within the SESAR Solution “Safety Support Tools for Avoiding Runway Excursions”. This SESAR Solution aims to mitigate the risk of runway excursion, to optimize airport operation management by decreasing the number of runway inspections, to make chemical treatment effective with respect to the environment, and to increase resilience, efficiency and safety in adverse weather situations. The proposed approach is based on the enhancement of runway surface condition awareness by integrating data from various sources. Dangerous windy conditions based on Lidar measurements are also discussed as another relevant factor in relation to runway excursions. The paper aims to explore four different data mining methods to obtain runway conditions from the available input data sources, examines their performance and discusses their pros and cons in comparison with a rule-based algorithm approach. The output of the SESAR Solution is developed in compliance with the new Global Reporting Format of the International Civil Aviation Organization for runway condition description to be valid from 2020. This standard is expected to provide concerned stakeholders with more precise information to enhance flight safety and environmental protection. [View Full-Text](#)

Keywords: SESAR; safety; runway excursion; runway surface condition; data mining methods

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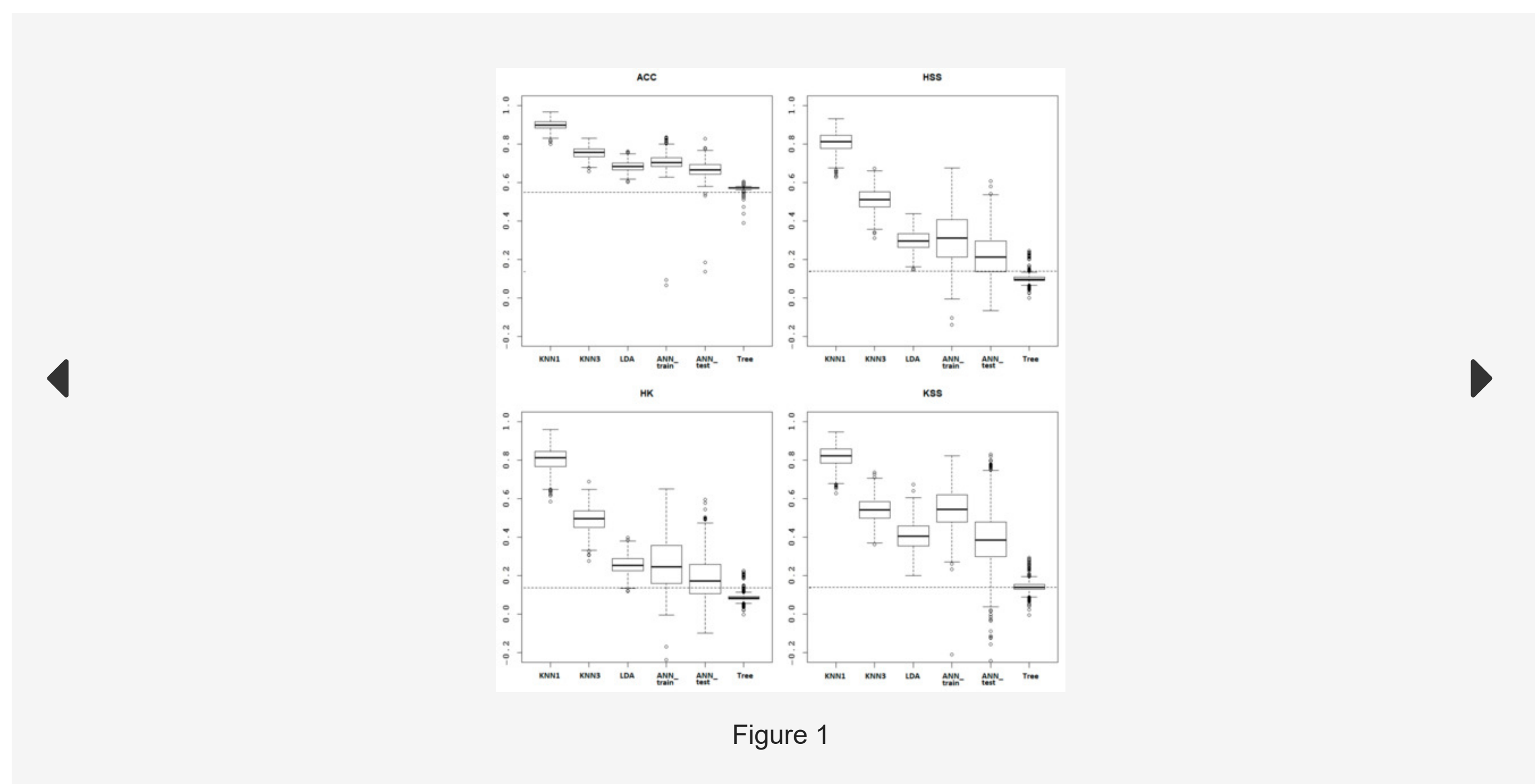


Figure 1

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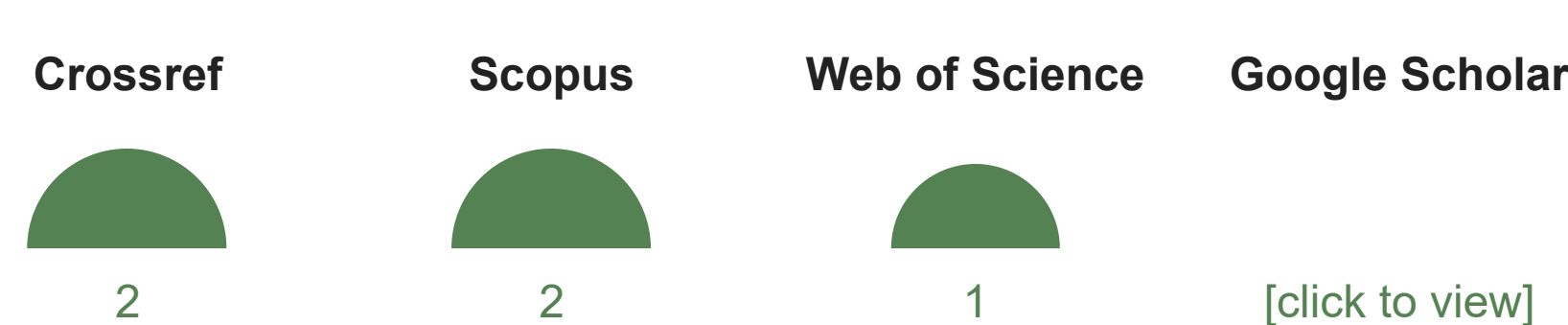
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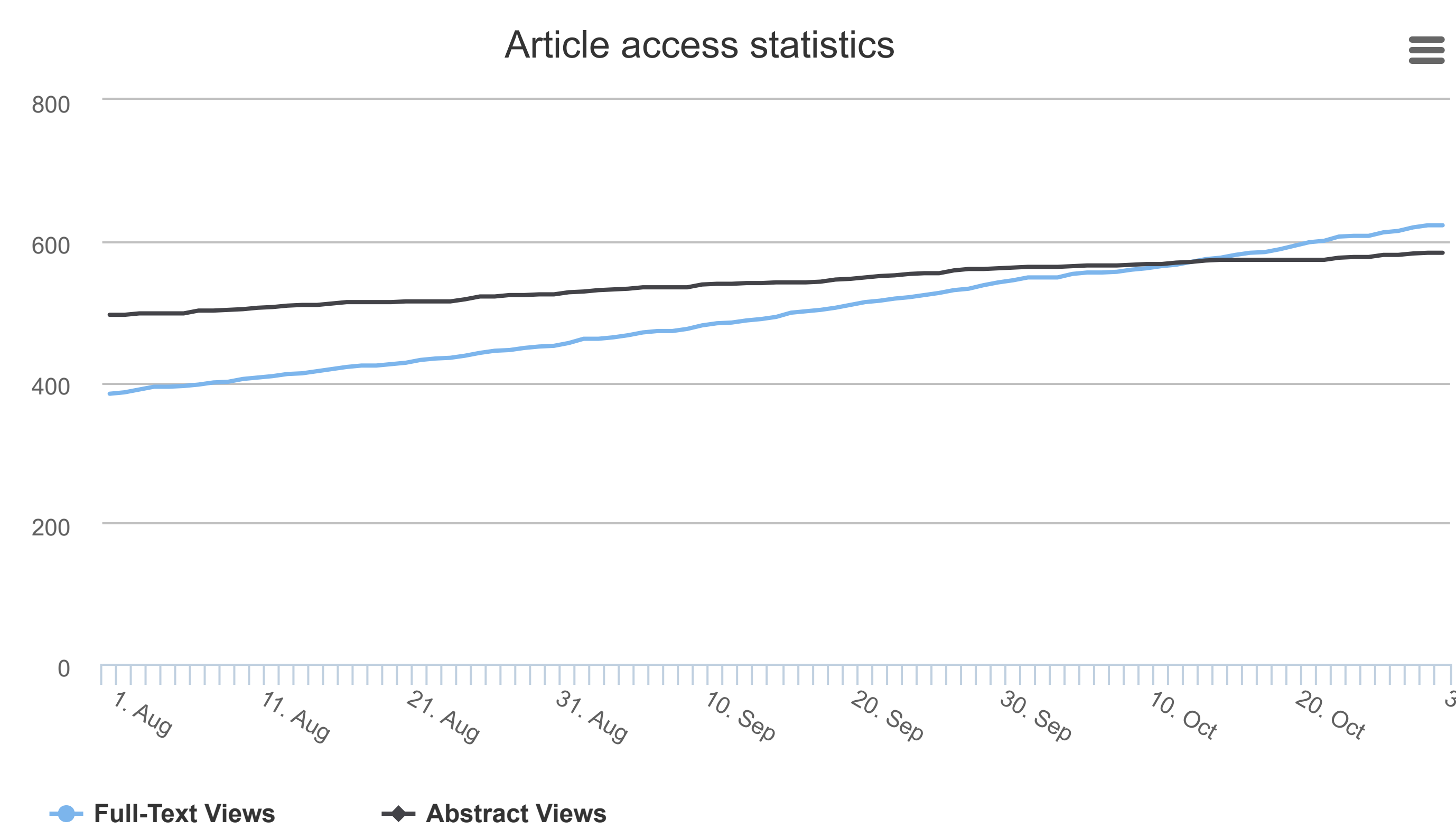
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