

**Session Detail Information**

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**Cluster : Aviation Applications**

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**Session Information : Wednesday Nov 16, 08:00 - 09:30**

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**Title: Measuring the Impact of National Air Transportation System Changes**

**Chair: Andrew Lacher**, Research Strategist, The MITRE Corporation, 7515 Colshire Drive, McLean 22102, United States, [alacher@mitre.org](mailto:alacher@mitre.org)

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**Abstract Details**

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**Title: A Proposed New Safety Metric to Measure Air Transportation Safety System**

**Presenting Author: Yue Xie**, George Mason University, 4400, University Dr., Fairfax VA 22030, United States, [yxie@gmu.edu](mailto:yxie@gmu.edu)

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**John Shortle**, Assistant Professor, George Mason University, Dept. of Syst. Eng. Mail Stop 4A6, Fairfax VA 22030, United States, [jshortle@gmu.edu](mailto:jshortle@gmu.edu)

**Abstract:** Aviation safety is usually measured by accident rates, calculated as the number of accidents divided by total operations in a time unit. Research in aviation safety has indicated that safety is related with the internal and external factors of the system in a complex and nonlinear manner. We propose a safety metric in logarithmic scale based on the research in aviation safety. The new metric is expected to reflect the nonlinear characteristics of aviation safety more efficiently.

**Title: Effect of Controller-pilot Data Link Communications on En-route Sector Routing Efficiency**

**Presenting Author: Jasenka Rakas**, [jrakas@ce.berkeley.edu](mailto:jrakas@ce.berkeley.edu)

**Co-Author: Michael Bennett**, [mike.ctr.bennett@faa.gov](mailto:mike.ctr.bennett@faa.gov)

**David Knorr**, Federal Aviation Administration, Washington DC, [Dave.Knorr@faa.gov](mailto:Dave.Knorr@faa.gov)

**Abstract:** We analyze effects of controller-pilot data link communications (CPDLC) on sector routing efficiency and hypothesize that reduced voice channel occupancy results in more timely vectoring of aircraft onto their original routes in cases where they previously have been vectored off-route to resolve conflicts. We test this hypothesis by studying the relationship between voice channel occupancy and the excess distance caused by conflict resolutions.

**Title: En-Route Air Traffic Modeling and Strategic Flow Management using Mixed Integer Linear Programming**

**Presenting Author: Charles-Antoine Robelin**, Graduate Student Researcher, UC Berkeley, [robelin@ce.berkeley.edu](mailto:robelin@ce.berkeley.edu)

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**Abstract:** An Eulerian model of air traffic flow is developed for the National Airspace System and validated against real data at the level of one Center. The model relies on an integrated linear dynamical system framework. This is used to assess real-time controllability using user-defined metrics (sector counts, inbound flows). Empirical evidence of fast run time using Mixed Integer Linear Programming is provided, which makes the method applicable to online strategic traffic flow management for one Center.

