From the Editor

Publication Date

This issue is the third of Volume 41 of *TS*, corresponding to July-September 2017. For the record, the issue was published in March, 2019.

About this issue

In this issue, the main articles deal with meteorological topics. The first paper, contributed by Nilcan Akataş et al. and titled "Investigation of the Vegetation Effects on Convection by Using COSMO-CLM", was presented at the XXXIII Congress of the OSTIV held in Benalla, Australia, in January 2017. It was honored with a best students paper award. Congratulations!

The second article, prepared by Edward Hindman, focusses on an important safety aspect everyone should be well aware of when soaring gravity waves: Don't get caught on top!

Right after the editor's section, a short note follows on weather forecasting for soaring flight based on numerical weather prediction models (NWP). This contribution was also provided by Ward Hindman. It is not a full, reviewed article but I think it contains valuable information on the current status of NWP that is of interest for the soaring community. I will continue these informal notes in *TS* whenever I receive interesting stuff. For example, in one of the next issues you will find a short note on new handicap factors for club class gliders that are used in German glider competitions.

AIAA Aviation 2019

If you get the chance to visit the 2019 AIAA Aviation and Aeronautics Forum and Exposition held on 17–21 June at the Hilton Anatole, Dallas, Texas don't miss to attend the "Special Session: Low Speed and Motorless Flight". The session is scheduled for the first day, starting at 9:30am in hall Cortez D. Chair will be Judah Milgram, who made me aware of this event. The following technical papers will be presented:

- Flight Testing Stability and Controllability Otto Lilienthal's Monoplane Design from 1893.
- Aerodynamic Design of a Morphing Wing Sailplane
- Studies of Anisotropic Wing Shell Concepts for a Sailplane with a Morphing Forward Wing Section.
- Flight Trajectory optimization of a Sailplane after Rope Break during Tow-Assisted Takeoff.
- Stability and Stability Augmentation of Dynamic Soaring Orbits.

Sounds interesting!

Acknowledgments

We gratefully acknowledge Associate Editor Zafer Aslan, who oversaw the review of the Hindman paper in this issue.

Very Respectfully,

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Status and future of weather forecasting for soaring flight based on predictions from numerical weather prediction (NWP) models

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The status – as of 2009 – of weather forecasting for soaring flight was detailed by the OSTIV Meteorological Panel in a World Meteorological Organization publication [1]. The aim of the publication is to provide an internationally agreed set of guidelines for meteorological forecasting in soaring flight and related activities.

Since that publication, Liechti [2] presented a NWP-based system for predicting soaring flight in isolated and aligned lift for Europe. Hindman [3] presented a less sophisticated system for predictions world-wide. Both investigators reported the forecasts to be accurate.

Three additional NWP-based soaring weather prediction

Presented at the meeting of the OSTIV Meteorological Panel, Benalla, Australia, 13 January 2017

systems, used world-wide, are found on the Internet. To my knowledge, the systems have yet to be reported in the peer-reviewed literature. First, regional atmospheric soaring predictions (RASP), using a locally-run US weather research and forecasting (WRF) model, are user-generated following guidance from the RASP web site `www.drjack.info/DRJACK/RASP/index.html`. Second, global soaring weather forecasts are available at the XC Skies website `www.xcskies.com`. They are derived from predictions made by the US North American mesoscale (NAM) and global forecast system (GFS) models. Third, soaring weather forecasts for Europe and the US are available from the TopMeteo site `www.topmeteo.eu/weather/gliding`. They are derived from predictions made by unspecified NWP models. Presumably these three systems, the last two require subscriptions, produce accurate forecasts otherwise they would not be on the Internet? Rogers [4] reports "my impression from many flying seasons is that XC Skies thermal strengths are too strong, TopMeteo's and DrJack's too conservative ....I'd say plus or minus 30%".

A significant contribution to soaring meteorology would be a peer-reviewed report of a comparison of predictions made by the Liechti, Hindman, RASP, XC Skies and TopMeteo systems with flights from a World Gliding Championship, following Liechti's validation procedure [2].

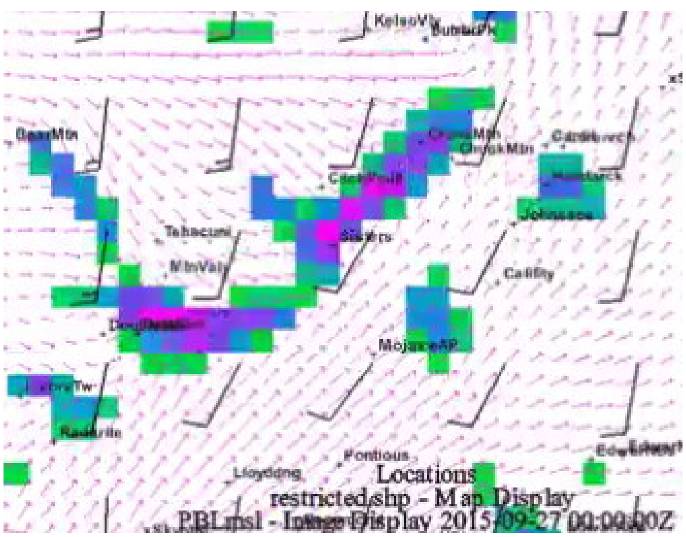

Fig. 1: One frame of an animation of surface winds that reveal convergence zones and the resulting regions of expected rising air (colors). The animation is available via wrogerswx@gmail.com.

The US has developed a high-resolution (3km), rapid-refresh (15min) NWP model, called the HRRR (`ruc.noaa.gov/hrrr/`), which resolves isolated and aligned convection and mountain waves. US meteorologist and glider-racing pilot Walter Rogers has developed unique displays of soaring weather using HRRR model predictions. For example, Fig. 1 is one frame of an animation of surface winds that reveal convergence zones that led to convection. As I understand, these animations have been shown at morning pilot briefings and the actual zones were flown in the afternoon. A careful comparison of the predictions with glider flight recorder data would establish their accuracy and usefulness.

The Perlan Project (`www.perlanproject.org`) is attempting to fly an engineless aircraft to the edge of space. As reported on the website, "three groups of phenomena have been simulated with numerical models in the mid-latitude atmosphere; however, experimental data is rare with which to validate these simulations". Further, the project claims to represent a balanced effort among modeling, observations and theory. To date, the project has measured 3-dimensional wind fields in mountain waves using sailplane flight data as reported by Zhang, et al. [5]. And, Millane et al. [6] reported that Jim Doyle of the US Naval Research Laboratory numerically simulated the atmospheric flow for the 2016 Perlan world-record-altitude flight with the following significant result: the location of the predicted rising air corresponded well to the actual location of the flight. Bravo!

Now, imagine, prior to another Perlan launch, the Doyle model is used to predict the atmospheric flow. And, using the flow, a flight path is proposed. Then, after the flight, the flight recorder data is compared to the proposed path and the path is validated! And, if this result is reported in the peer-reviewed literature, the project could add immensely to our knowledge of predicting mountain waves.

In conclusion, the future is bright for using glider flight data to validate soaring weather predictions resulting from NWP models and reporting the results in the peer-reviewed literature.

References

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