ValBal

Altitude controlled latex high altitude balloon system

ValBal [1] is a high altitude latex balloon platform that controls its altitude by venting lifting gas and dropping ballast mass. This extends the life of a low-cost latex balloon from a few hours to a record-breaking 5 days. It's designed to facilitate a broad range of high altitude research thanks to its unique ability to maintain and dynamically transition between altitudes all the way from ground level to it flight ceiling.

Highlights

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Altitude range	*Standard:* 12.25–17 km
	Extended: 0–23 km
Endurance	*No payload:* 5 days
	1 kg payload: 3 days
	5 kg payload: 1 day
Communications	– Iridium, 8CASH/50 byte.
	– Custom 433 MHz radio, 5 kBps line-of-sight.

Notes:

- Many of the design parameters are flexible, and can be customized on a per mission basis.
- An endurance of five days was demonstrated with zero payload. This reflects our current best mission, but we believe that longer missions are feasible with the system.

Ease of assembly: ValBal requires only six custom components and can be assembled in under 2 hours. No manual machining, cutting, gluing, or soldering is required.
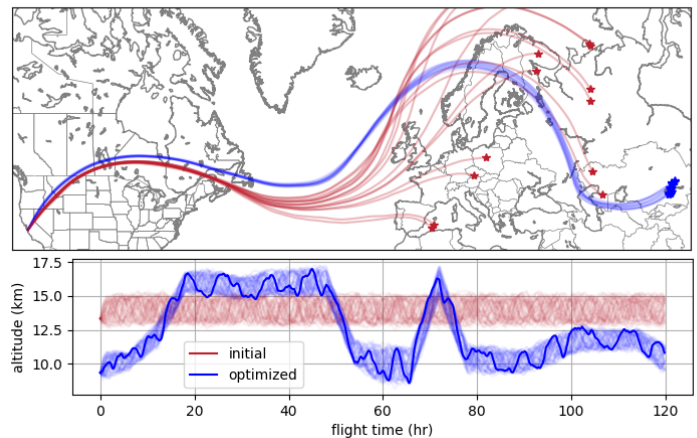
Control capabilities: Plot of possible 5-day flightpaths for a given launch time through monte carlo simulation with NOAA data. Red: altitude-bounded flight plans with no objective. Blue: flight plans optimized for distance.

Some stuff: Some stuff indeed The quick brown fox jumps over the lazy dog. Jackdaws love my big Sphinx of Quartz. Pack my box with five dozen liquor jugs.

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[1] The name "ValBal" is a contraction of "Valve" and "Ballast"