Introduction

Given the difficulty of identifying the distinctive features of the shuttle and missile objection, I presented this objection to Perplexity. The exchange took approximately two hours, as the AI had considerable difficulty following the reasoning from beginning to end.

The text below is the synthesis produced by Perplexity at the end of that exchange. It is reproduced in full, without modification.

Philippe de Bellescize

From One-Way Light Propagation to the Missile: Philippe de Bellescize’s Objection and Its Historical Precedents

Summary of Our Exchange

Philippe de Bellescize does not start from presentism in order to demonstrate presentism. His starting point is **the invariance of the one-way speed of light**. He argues that this entails a relativity of simultaneity which, in his view, has **physical significance**, rather than a purely conventional significance associated with the choice of coordinates.

In his commentary on Einstein’s train thought experiment, Bellescize interprets the situation as revealing a physical difference: a light ray may have already been emitted “with respect to” one observer, but not yet “with respect to” another. He then applies this idea to the shuttle and missile objection. When the shuttle accelerates, its plane of simultaneity changes; Bellescize argues that the trajectory of the missile behind the shuttle then becomes problematic, because the missile seemingly has to be regarded as having already been launched according to one plane of simultaneity, and subsequently as not yet having been launched according to another. (leprincipemoteurdelunivers.com)

The open letter to Aurélien Barrau frames the challenge as follows: **where does the reasoning break down?** Should one point out that coordinates are strictly conventional—which, according to Bellescize, would strip the plane of simultaneity of its physical significance and call into question the invariance of the one-way speed of light? Or should one adopt the block universe framework, in which case the trajectory of the missile behind the accelerating shuttle would, in his view, remain problematic?

In other words, Bellescize asks his interlocutor to identify precisely **which step in his reasoning is mistaken**. He does not present presentism as his starting point: he maintains that it follows from what he considers to be the consequences of the invariance of the one-way speed of light.

Historical Perspective: Long-Standing Questions, a Distinctive Objection

The objection belongs to a long history of debates about distant simultaneity and the one-way speed of light. Even before relativity, Poincaré had discussed the status of simultaneity. Einstein subsequently defined a procedure for synchronizing distant clocks using light signals. Later, Hans Reichenbach and other philosophers and physicists developed the debate over whether this synchronization—and hence distant simultaneity—is determined by physical facts or depends partly on a convention. (plato.stanford.edu)

Two ideas must nevertheless be distinguished:

• **The relativity of simultaneity**: reference frames in relative motion do not divide spacetime into the same sets of simultaneous events.

• **The conventionality of simultaneity**: the question of whether simultaneity between distant events is uniquely fixed by physical facts or depends on the choice of clock synchronization.

These debates are directly relevant to the first step of Bellescize's argument. However, they do not, by themselves, reproduce his reasoning concerning the missile. His approach adds a distinctive thesis: planes of simultaneity would have a physical significance allowing conclusions to be drawn about the occurrence or existence of events, and the shuttle's acceleration would reveal a difficulty concerning the missile's trajectory.

There are therefore **historical parallels** with debates about the conventionality of simultaneity, as well as with philosophical discussions of presentism and the block universe. However, in the sources consulted, I have not identified a precedent combining exactly the same elements: the invariance of the one-way speed of light, the physical interpretation of planes of simultaneity, and the missile behind the accelerating shuttle. This does not establish that the objection is entirely unprecedented; it means only that the familiar historical debates do not, at first sight, constitute the same objection.

The Point to Examine

During our exchange, I suggested examining the transition from **differences in the time coordinates assigned to events by different reference frames** to a difference concerning the **reality or existence** of an event. However, I did not demonstrate that this transition is mistaken. Bellescize's contention is precisely that it follows from one-way invariance, and he does not posit presentism as a premise.

Assessment: I have not established a decisive flaw in his reasoning. Identifying one would require showing precisely either that the invariance of the one-way speed of light does not entail the physical significance attributed to planes of simultaneity, or that the missile's trajectory remains consistent within the block universe framework. This summary therefore presents the argument and what is at stake, without claiming that Bellescize's conclusion has been demonstrated.

Important Links

• Bellescize's commentary on Einstein's train thought experiment

• The shuttle and missile objection

• Supplementary text: "Why My Objection May Go Unnoticed"

• Historical overview of the debate on the conventionality of simultaneity