SCOAR

- John Bane, UNC, Physical Oceanography
- Charlie Flagg, SUNY-Stony Brook, Physical Ocn
- Ken Melville, Scripps, Physical Oceanography
- Dan Riemer, UMiami-RSMAS, Atmospheric Chemistry
- Dick Zimmerman, ODU, Marine Ecology

  NEW MEMBER – APPOINTED FEBRUARY 2005
- Mike Prince, UNOLS
- Bob Bluth, NPS-CIRPAS
- Haf Jonsson, NPS-CIRPAS
- Steve Hartz, UAF, UNOLS-RVTEC

  NEW EX-OFFICIO MEMBER – APPOINTED FEBRUARY 2005

Article published in *Oceanography*, December 2004

UNOLS Establishes SCOAR to Promote

Research Aircraft Facilities for U. S. Ocean Sciences

BY JOHN M. BANE, ROBERT BLUTH, CHARLES FLAGG, CARL A. FRIEHE, HAFLIDI JONSSON, W. KENDALL MELVILLE, MIKE PRINCE, AND DANIEL RIEMER

The ocean sciences community is currently engaged in the process of defining new facilities that will support oceanographic research, education, and monitoring efforts for the next several decades. New research vessels, drilling ships, coastal and deep-ocean observing systems, satellites, and submersibles will be designed to increase ocean access in terms of geographical coverage, depth, temporal continuity, and resolution of events. Aircraft may be largely overlooked facilities that are capable of providing observations and data in ways that satisfy many research goals, and they should be considered an important component in the future mix of oceanographic facilities.

Aircraft are capable of greater speed, and therefore greater range and spatial coverage during a short time period when compared to surface and subsurface ocean research platforms. Such speed and range attributes lead to better synoptic coverage of oceanic and atmospheric variability. Aircraft-mounted sensors provide data with much of the appeal of the aerial view provided by satellites, but with much greater specificity, spatial and temporal resolution, and scheduling flexibility, and they can provide resolution adaptable to phenomena of interest. Aircraft are ideal for both fast-response investigations and routine, long-term measurements, and they naturally combine atmospheric measurements with oceanographic measurements on similar temporal and spatial scales. Aircraft surveys reach across a wide range of environmental and geographic conditions. For example, an aircraft can survey and collect remote-sensing data over shallow estuaries, the coastline, and offshore with one deployment and can do so in weather that might preclude a surface vessel from covering the same areas. Using smaller, less-expensive aircraft for near-coastal work can result in more coverage for certain types of data at lower cost than using research vessels.

Aircraft have a particular advantage for coastal observing that comes from the combination of speed and range they make available for remote measurements and expendable instrument deployment. The issue of aliasing in space and time is especially significant in the coastal environment where scales of air-sea-land interaction can vary too rapidly to be adequately covered by any affordable combination of ships, moorings, or autonomous underwater vehicles. Satellite remote sensing is valuable, but coverage is sometimes limited by satellite orbit parameters or by cloud cover, especially in coastal marine layers. Using phased-array technology, high-frequency radars can provide excellent coverage of surface currents (except very close to the coast) and surface waves, but they offer very limited subsurface measurements. Airborne remote and expendable measurements of sea surface temperature, subsurface salinity and temperature, surface waves and currents, ocean color, coastal morphology, coastal bathymetry, and important atmospheric and terrestrial variables can significantly enhance data

This article has been published in Oceanography, Volume 17, Number 4, a quarterly journal of The Oceanography Society.

Send all correspondence to: info@tos.org or 5912 LeMay Road, Rockville, MD 20851-2326, USA.

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Eos, Transactions, American Geophysical Union, Vol. 85, No. 41, 12 October 2004, Pages 402, 405

SECTION NEWS

OCEAN SCIENCES

UNOLS Now Oversees Research Aircraft Facilities for Ocean Science

In recognition of the increasing importance and value of aircraft as observational platforms in oceanographic research, the University National Oceanographic Laboratory System (UNOLS) has established the Scientific Committee for Oceanographic Aircraft Research (SCOAR). SCOAR aims to establish procedures for research aircraft that follow the present UNOLS practices for research vessel use, with the goal of making it understandable, and easy, and thus desirable, for oceanographic scientists to utilize research aircraft more.

For consistency with the operation of UNOLS ships, this will require UNOLS to designate appropriate research aircraft operating organizations to be National Oceanographic Aircraft Facilities (NOAFs), essentially like institutions that operate one or more UNOLS ships. UNOLS presently has one designated NOAF, the Center for Interdisciplinary Remotely Piloted Aircraft Studies (CIRPAS) at the Naval Postgraduate School, in Monterey, California.

SCOAR also will develop and disseminate knowledge about aircraft platforms, unpiloted aerial vehicles (UAVs), and airborne instruments that are presently in use in ocean science. It will also attempt to stimulate the development of new instrumentation that exploits airborne capabilities. For example, a synergistic evolution of UAVs and small, lightweight, low-power instrumentation is expected.

Motivation for the establishment of SCOAR came in part from the recognition that, at present, research aircraft in the United States are operated by a range of agencies, universities, and public corporations. The federal fleet includes some 40 aircraft operated by or for the Federal Aviation Administration (FAA), the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation (NSF), the Department of Energy (DOE), the Office of Naval Research (ONR), and the U.S. Coast Guard (USCG).

Most of these aircraft are used for specialized research and development, but several are available for oceanic or atmospheric research. An interagency committee, the Interagency Coordinating Committee for Airborne Geosciences Research and Applications (ICCAGRA), is charged with facilitating interagency cooperation and being a resource to senior-level management on airborne geosciences issues. The university research aircraft fleet is much smaller; however, information about these aircraft and how a new potential user might gain access to them has been neither centralized nor uniform across institutions.

SCOAR Activities and Goals

The four principal activities and goals for SCOAR are as follows:

- Provide recommendations and advice to the operators and funding agencies of the UNOLS-designated National Oceanographic Aircraft Facilities regarding operations, sensor development, fleet composition, fleet utilization, and data services.
- Inform and advise the ocean science user community about research aircraft facilities, including experiment design, facility usage, scheduling, and platform and instrumentation capabilities.
- Promote collaboration and cooperation among facility operators, funding agencies, and the scientific community to improve the availability, capabilities, and quality of research aircraft facilities.
- By promoting collaboration among the ocean science, atmospheric science, and other science communities using research aircraft, strive to improve utilization and capabilities for all of these communities.

ONR established CIRPAS as a research center at the Naval Postgraduate School in 1996 to operate a variety of manned aircraft and UAVs. CIRPAS provides measurements using an array of airborne and ground-based meteorological, aerosol, cloud particle, radiation, and remote sensors. It also conducts payload integration, reviews flight safety issues, and provides logistical planning and support around the world. In addition, CIRPAS assists in developing new airborne instrumentation. The CIRPAS Twin Otter has been widely used in oceanographic projects for the past 8 years (Figure 1).

Fig. 1. The CIRPAS UV-18A Twin Otter turboprop research aircraft. This twin turboprop Short Take-off and Landing (STOL) aircraft can cruise at low speeds for long durations over the ocean with a maximum endurance of 8 hours, maximum altitude of 7600 m, 35–80 m/s operational speed range, 200 amps of payload power, and an approximately 2400 kg useful load.

0096/3941/8320/217/$03.00.

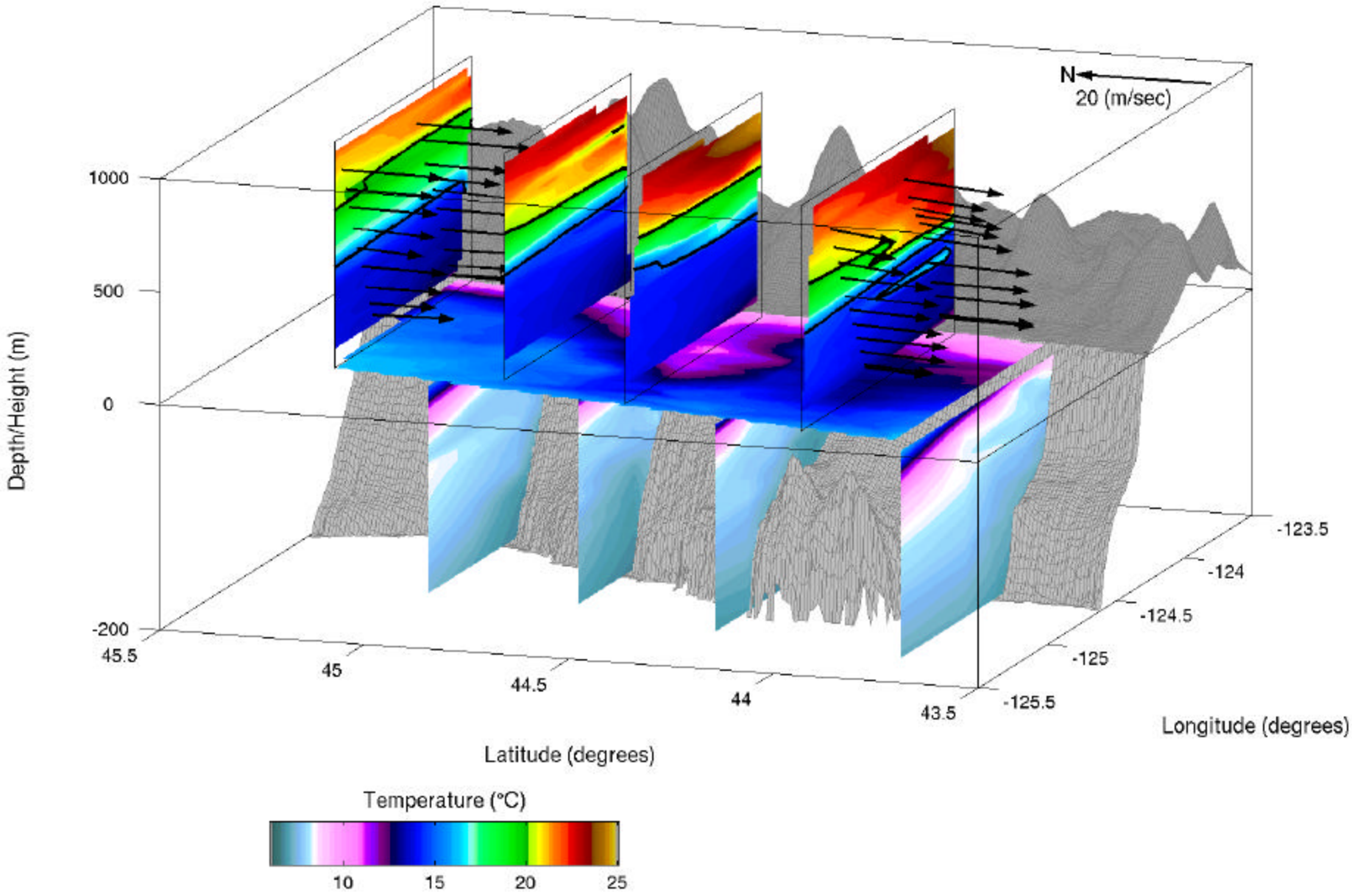
News report published in *EOS* in October 2004

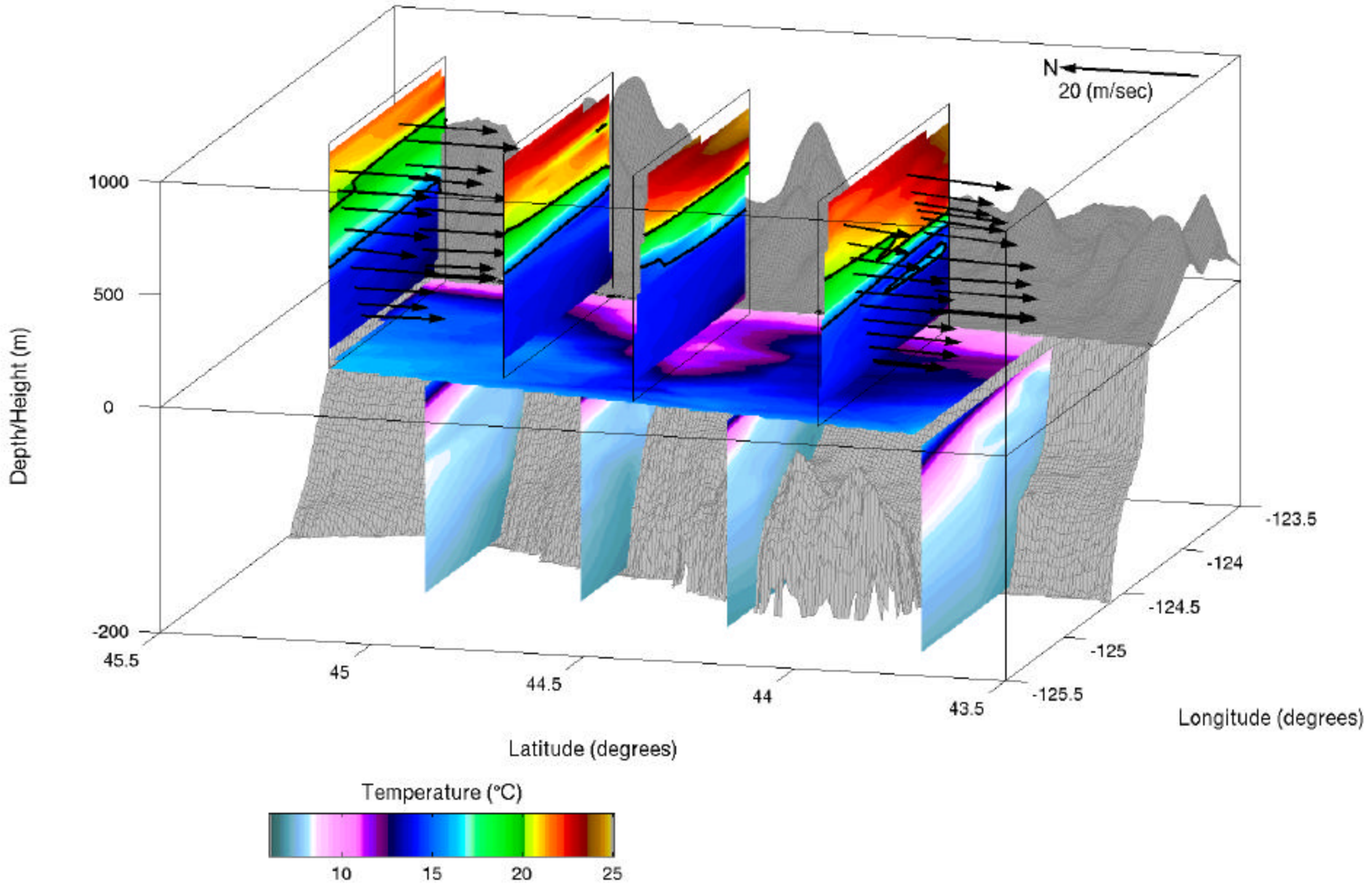
Current SCOAR Activities

- Drafted a white paper on how aircraft can and should support ocean sciences.

Visualizing The Coastal Ocean and Atmosphere

John Bane, Univ North Carolina (support: NSF)

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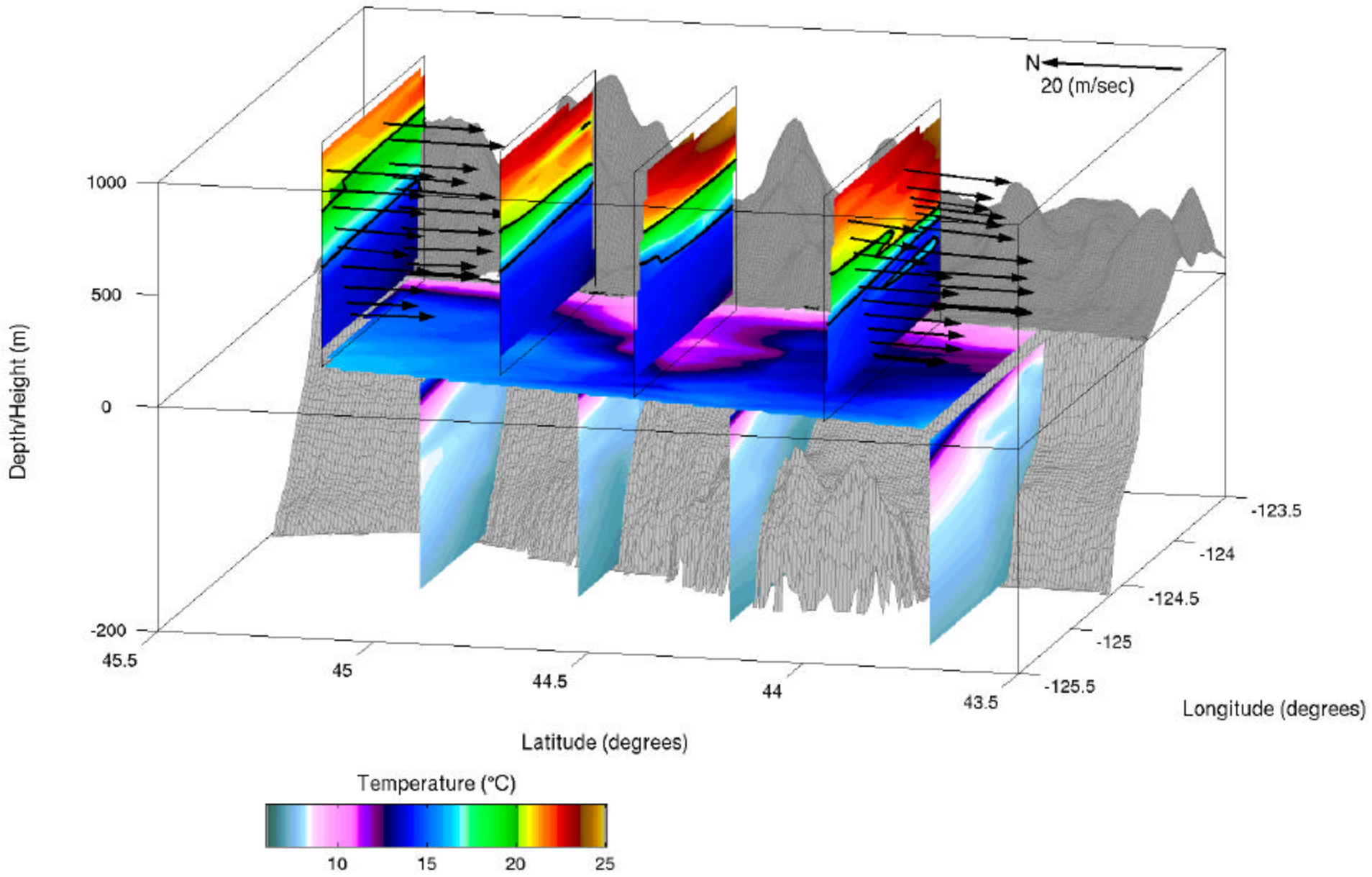
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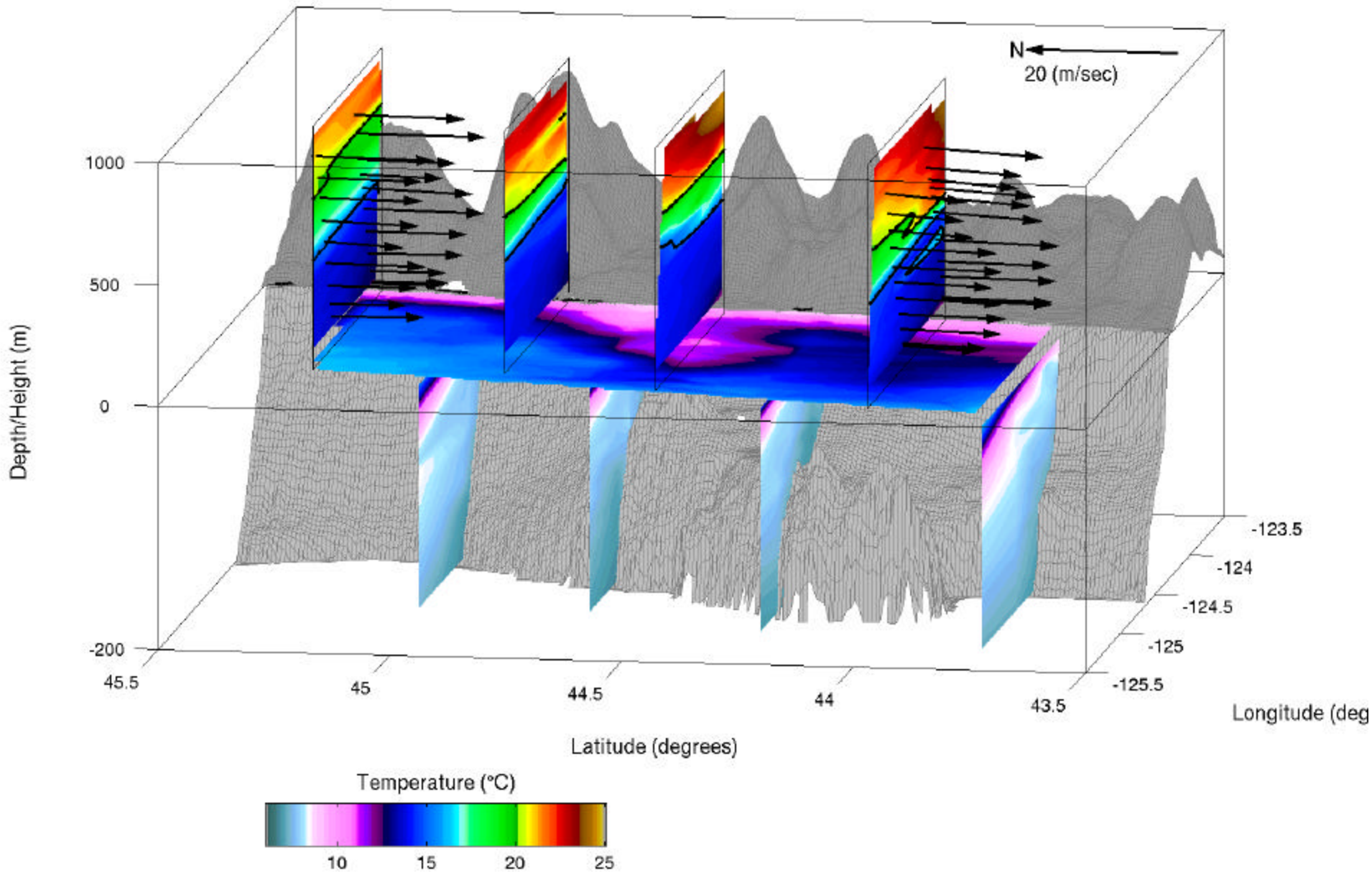
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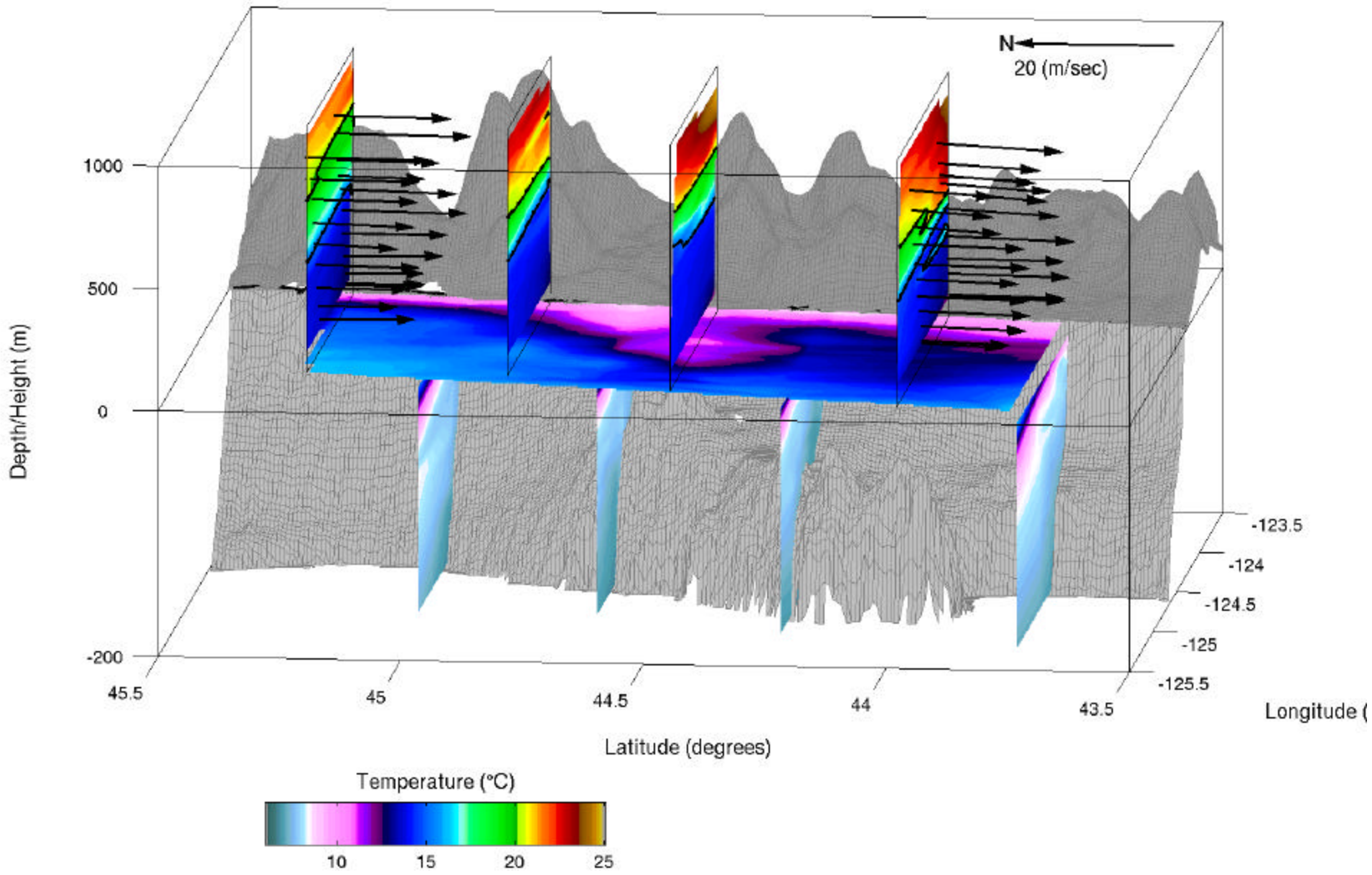
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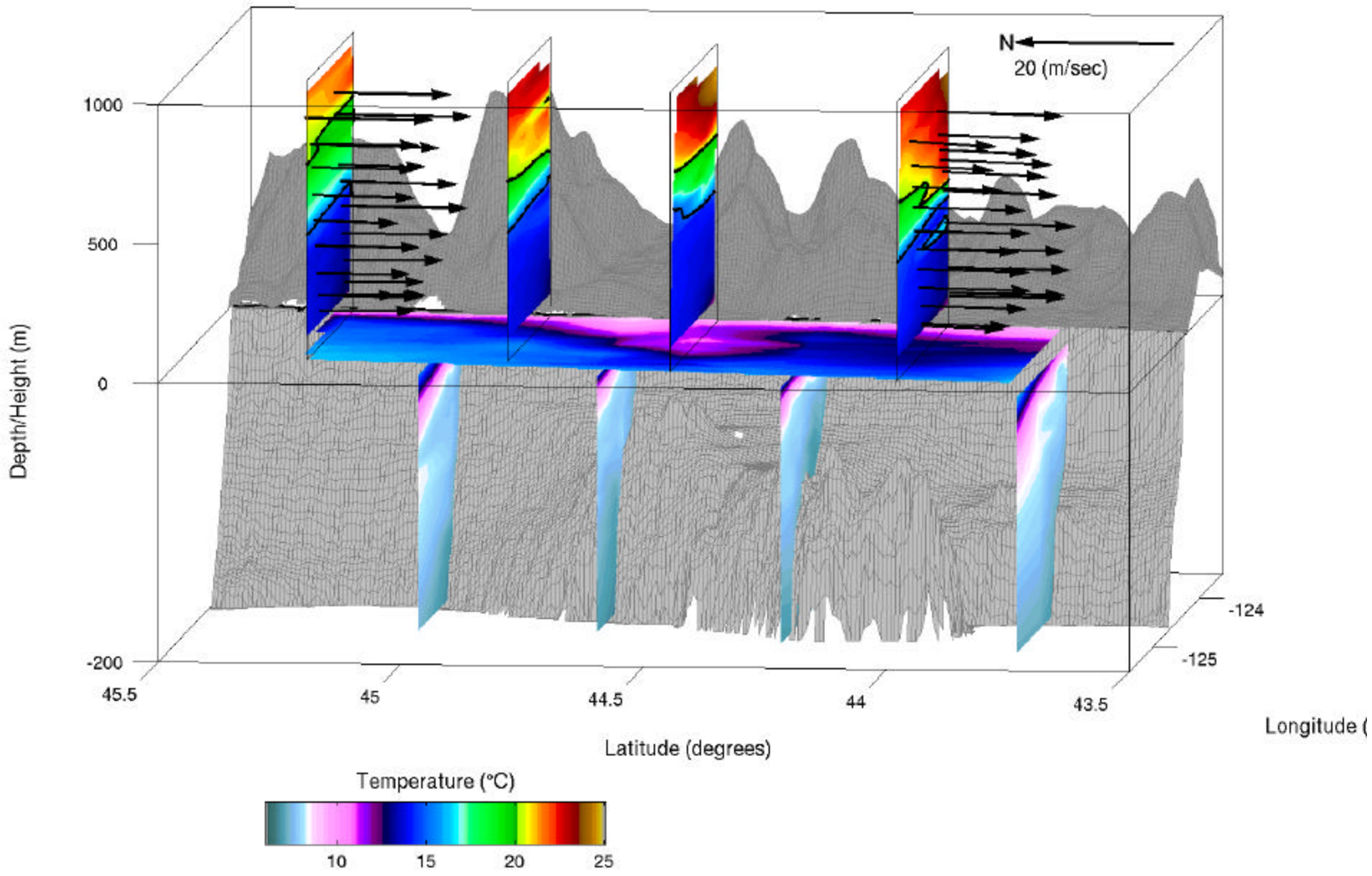
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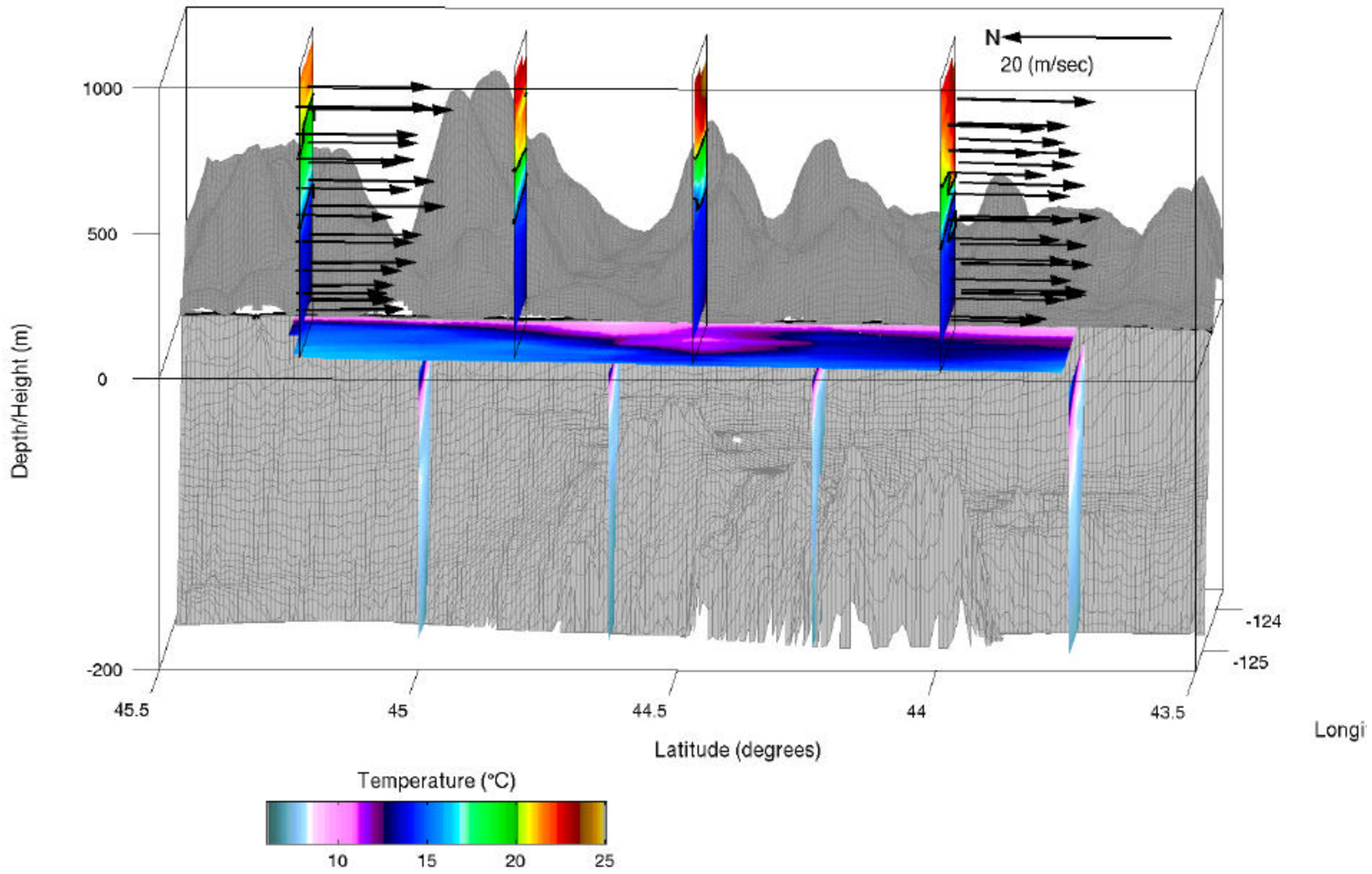
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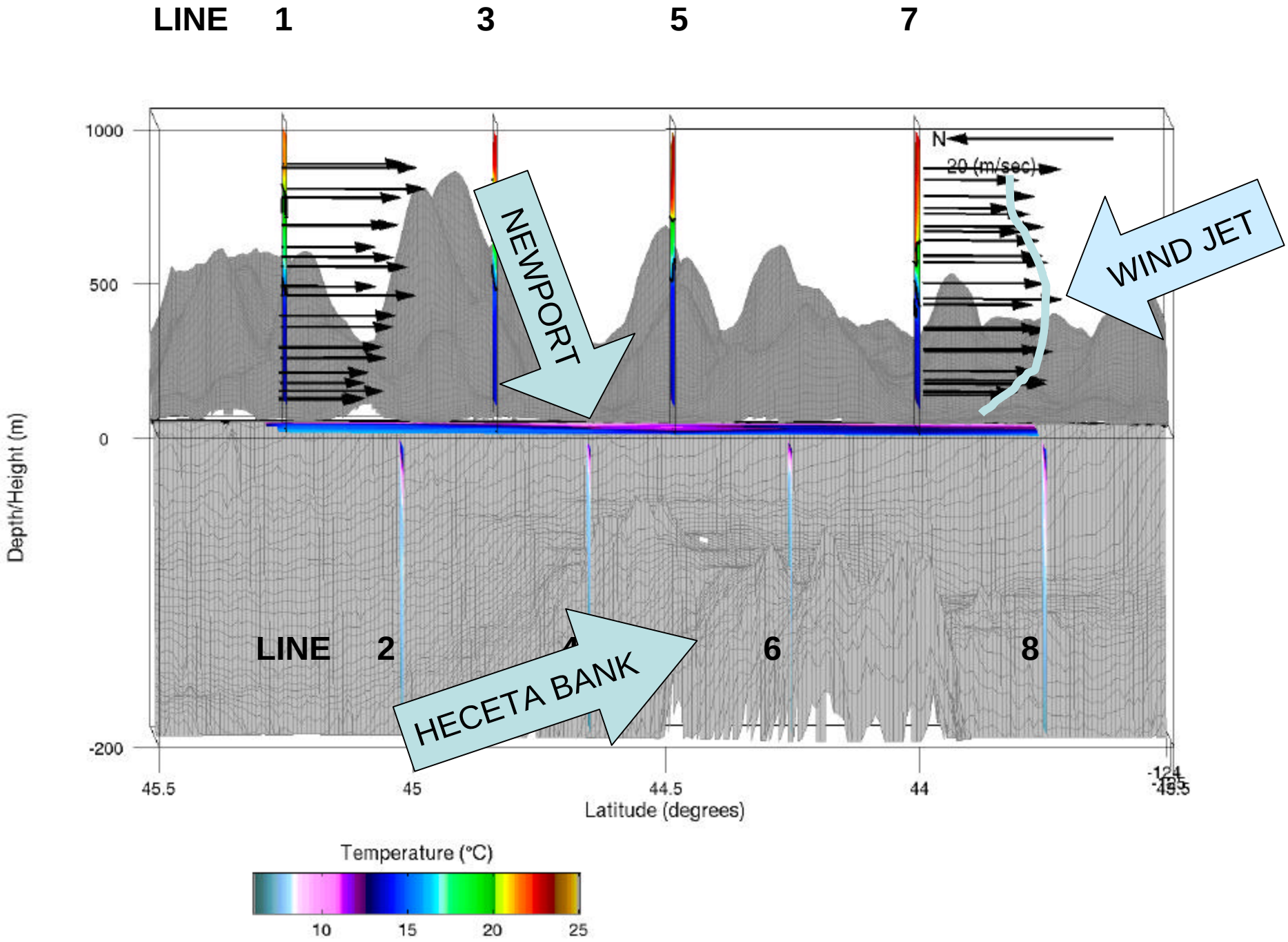
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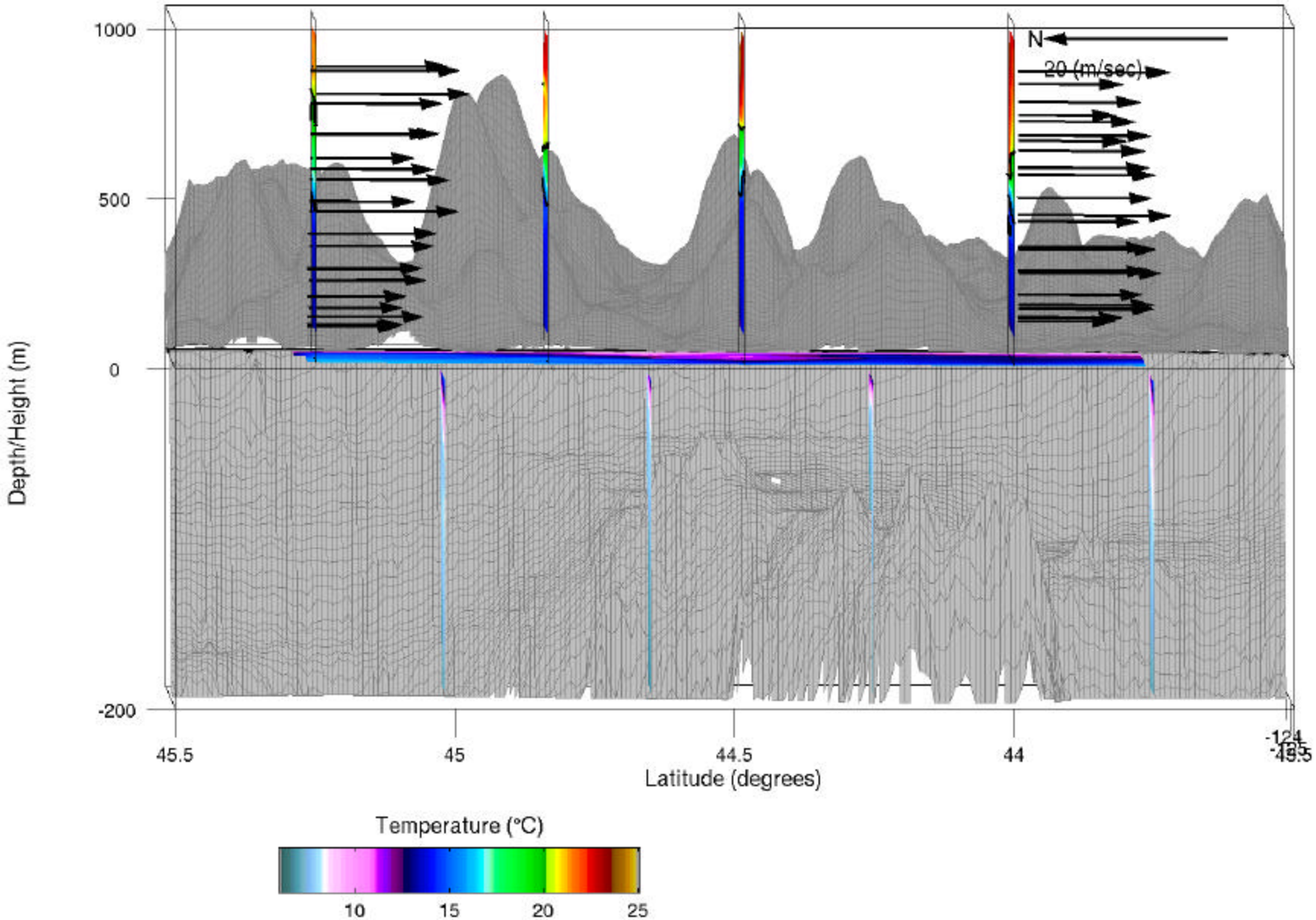
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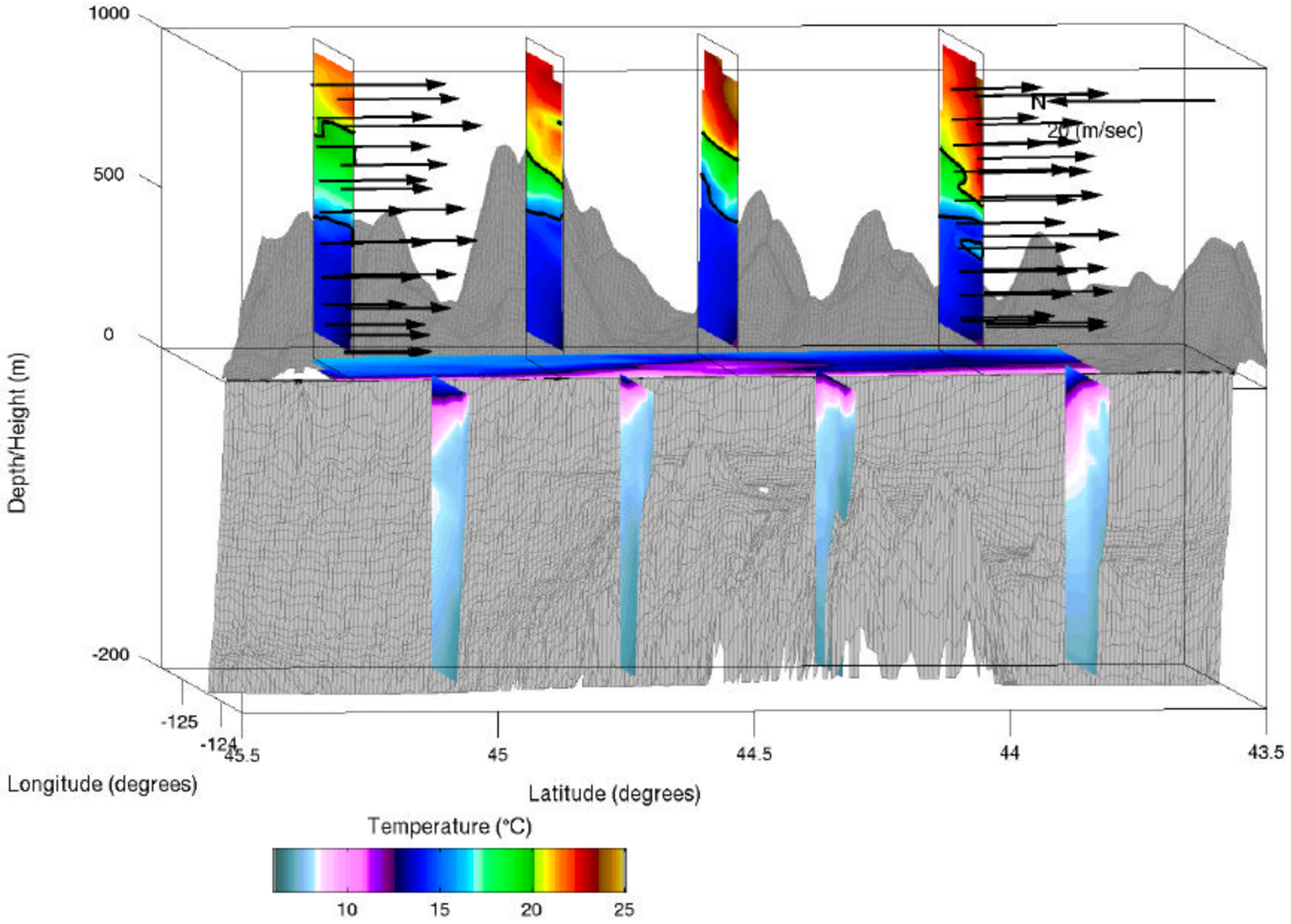
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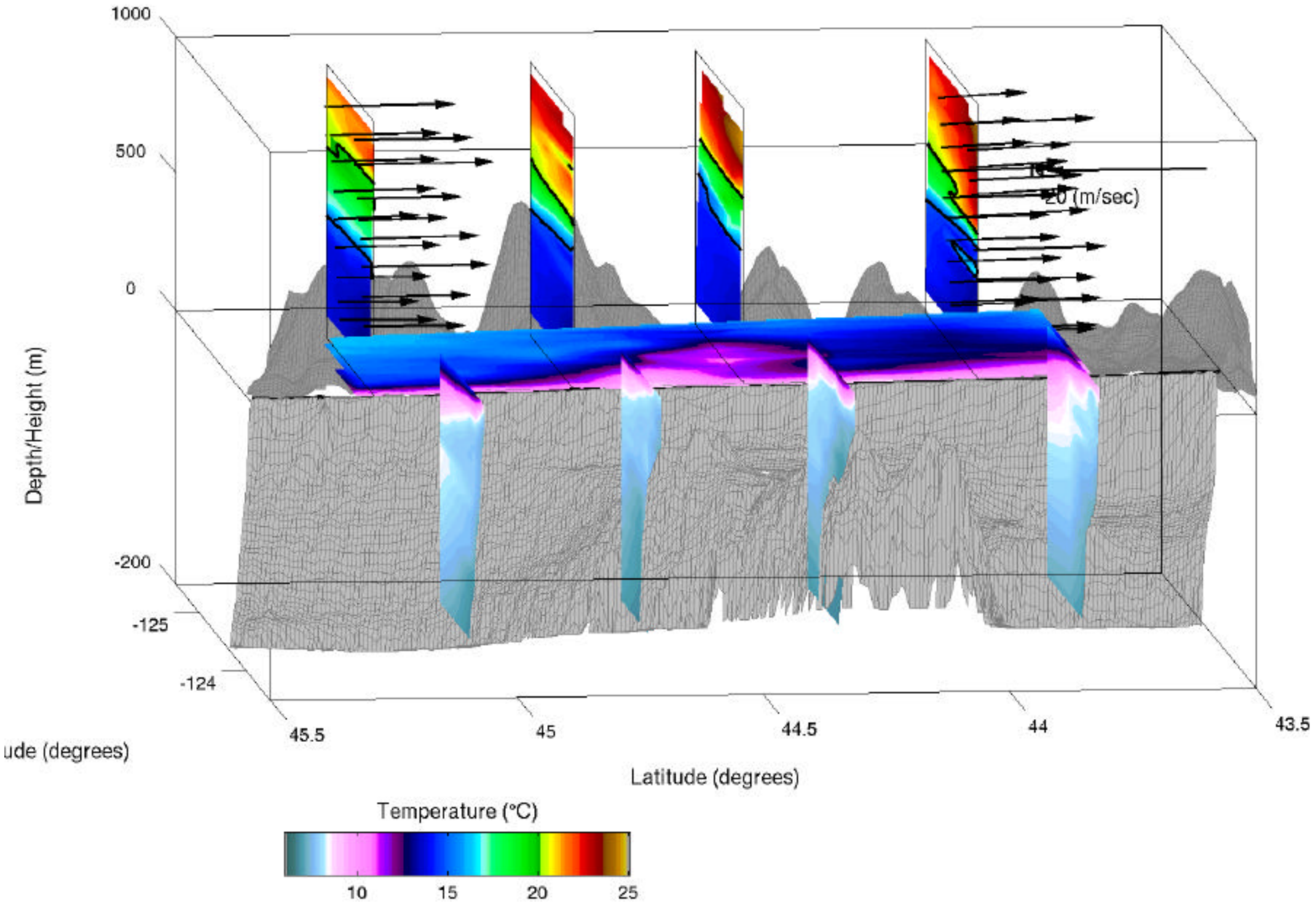
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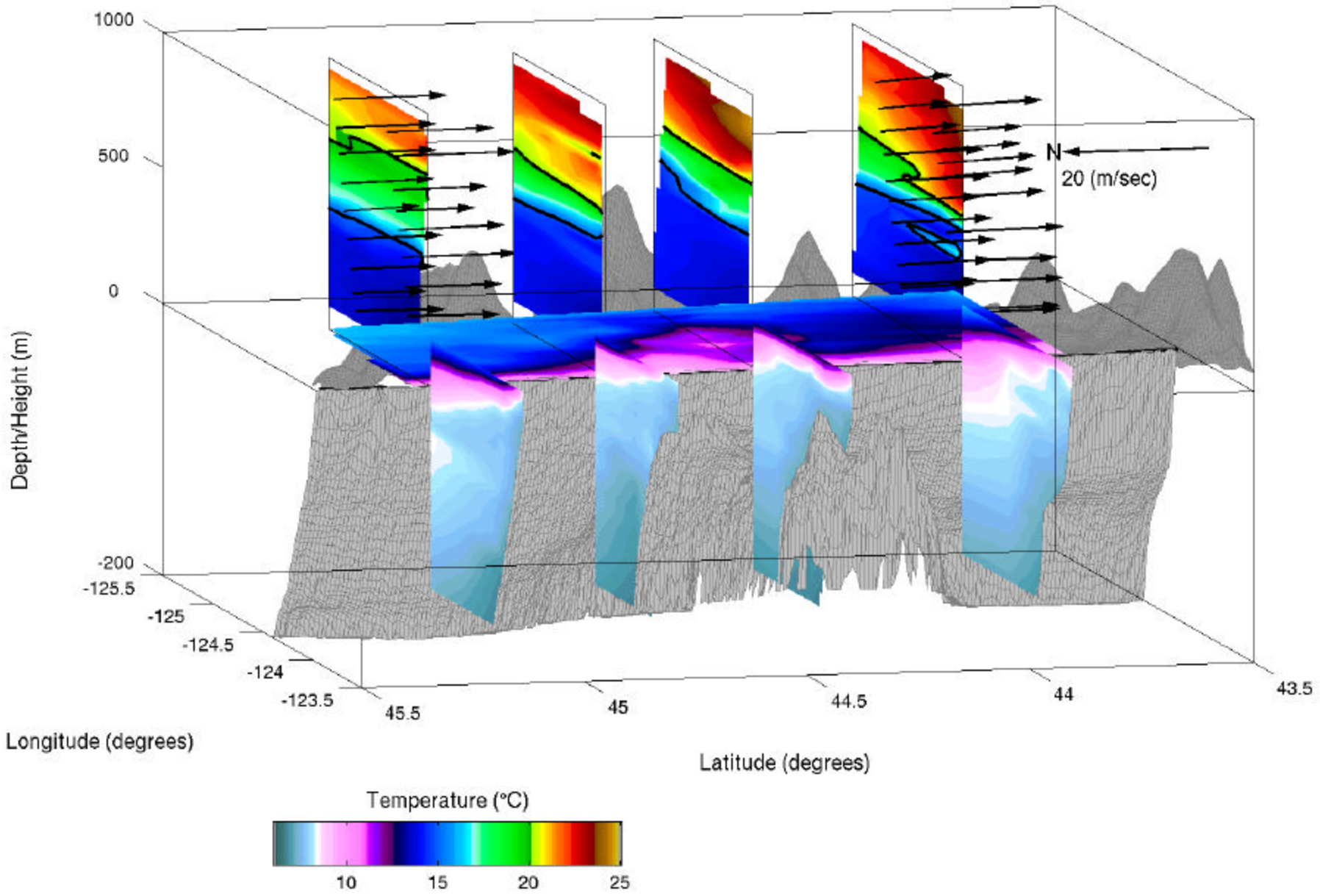
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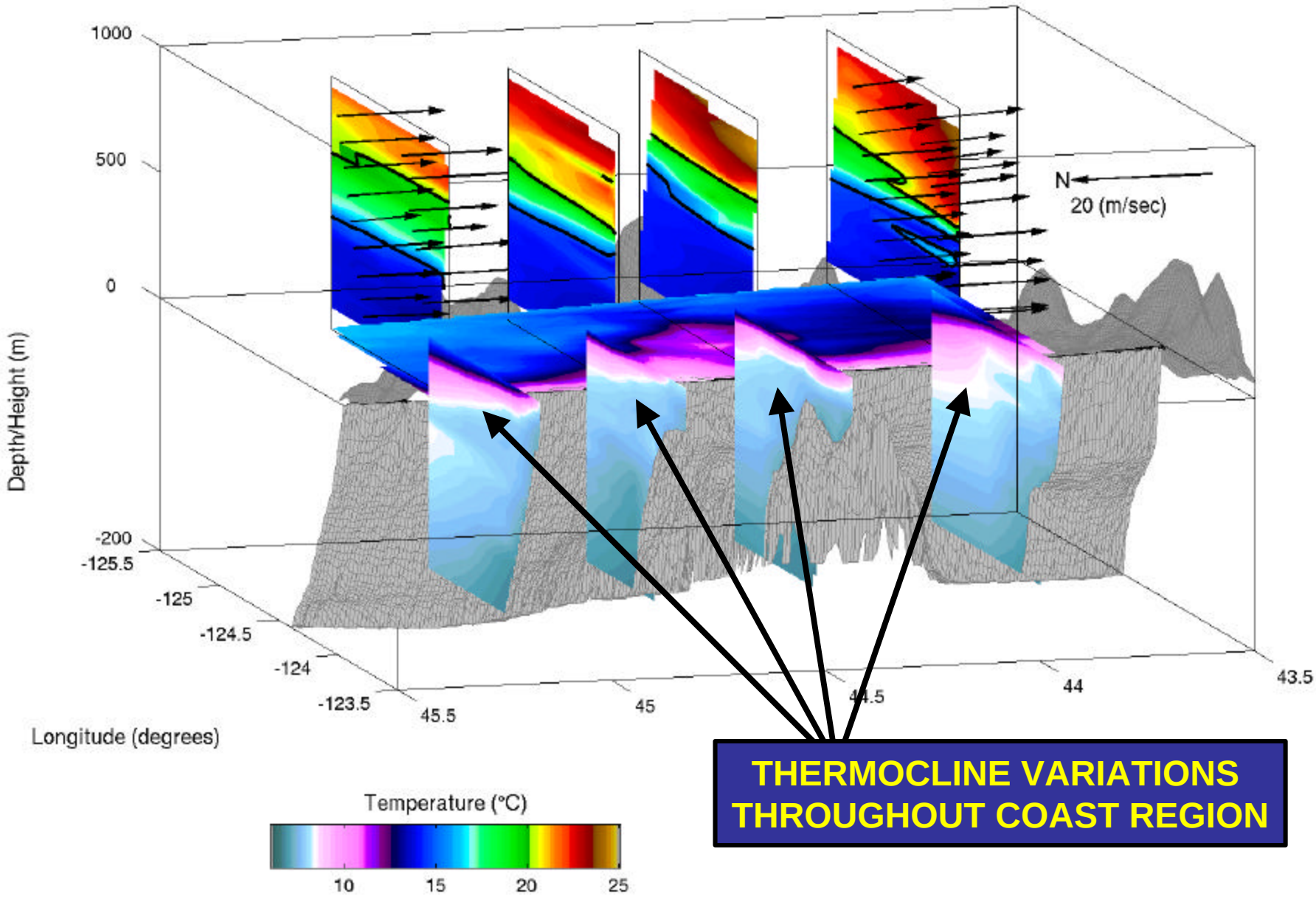
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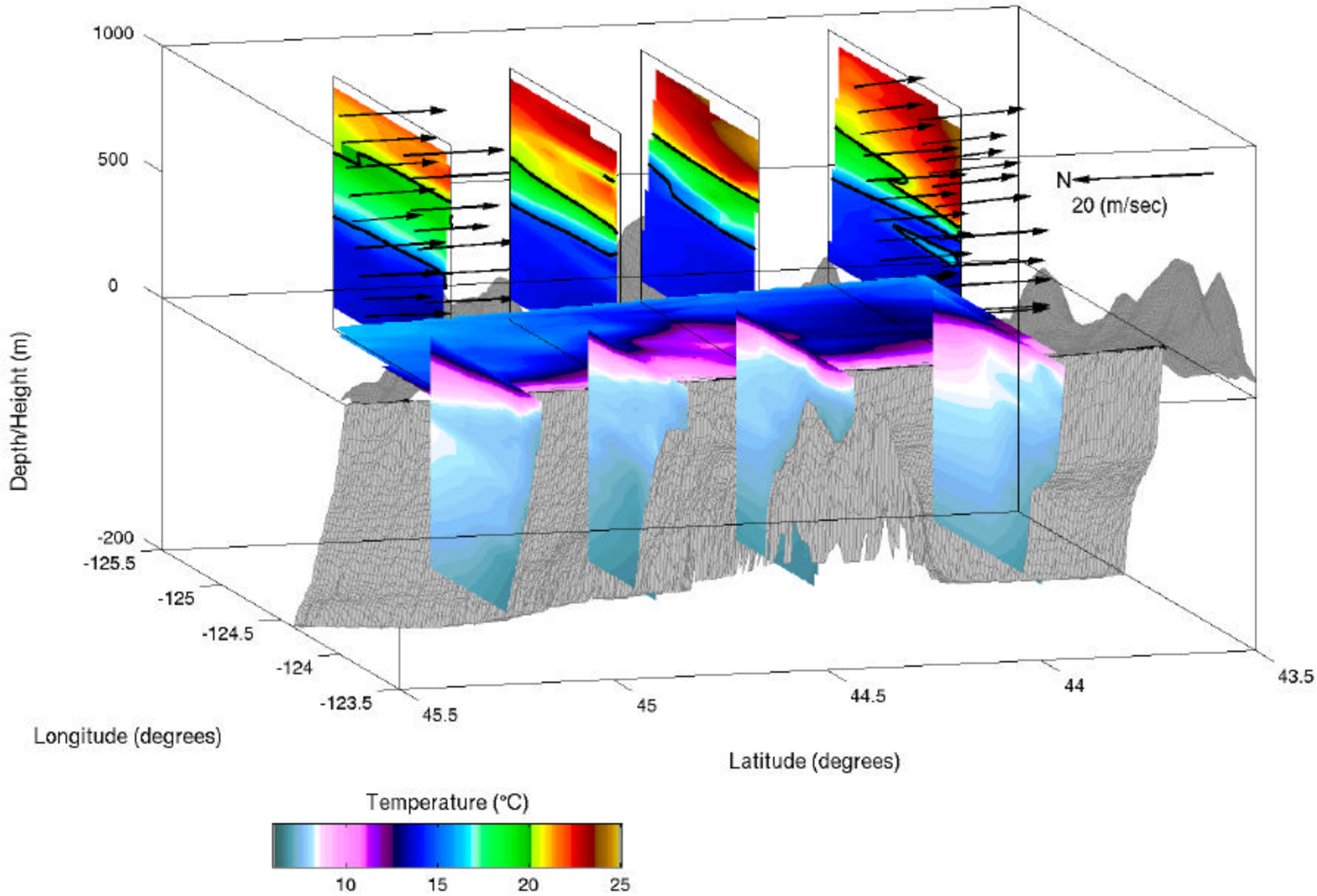
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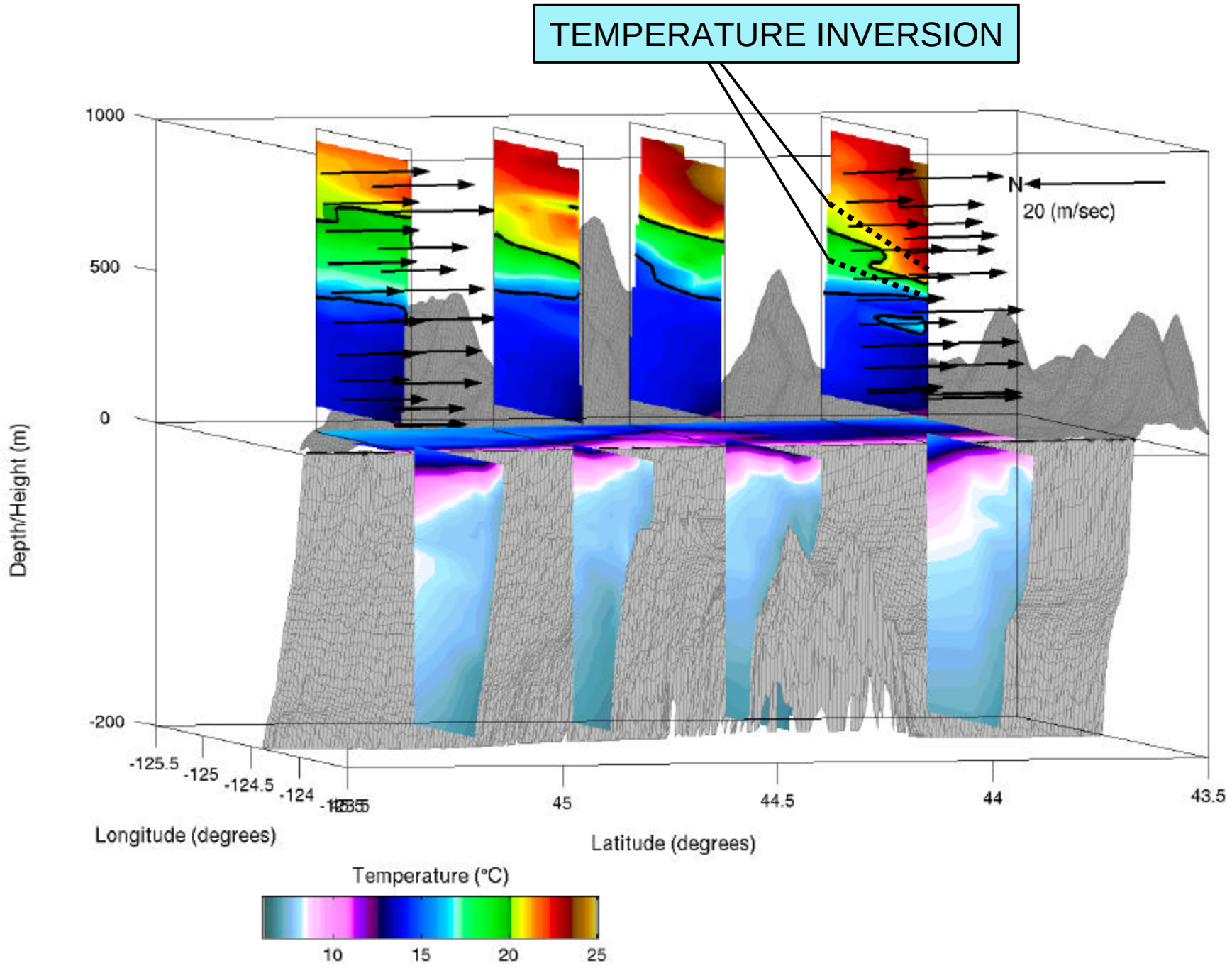
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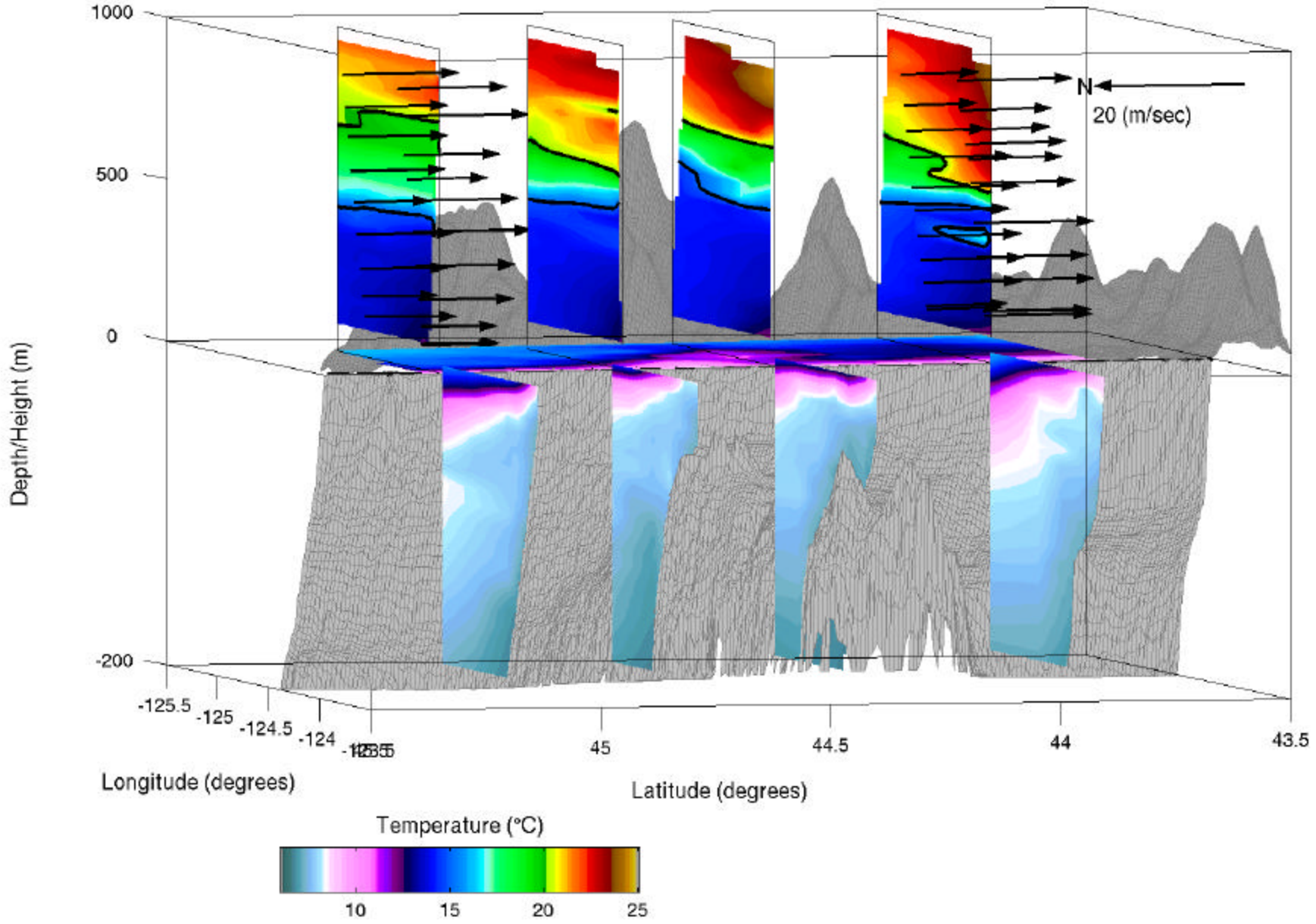
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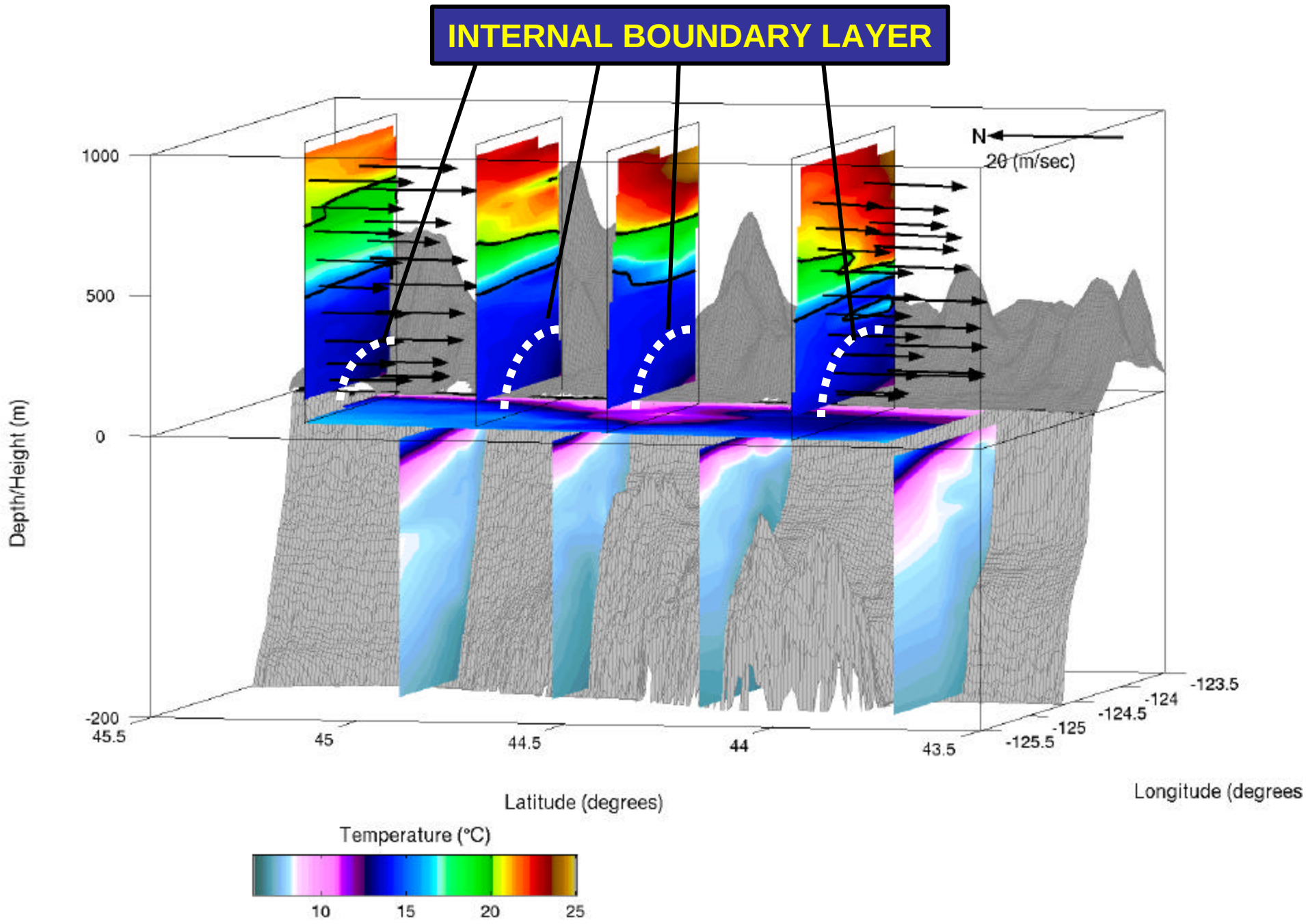
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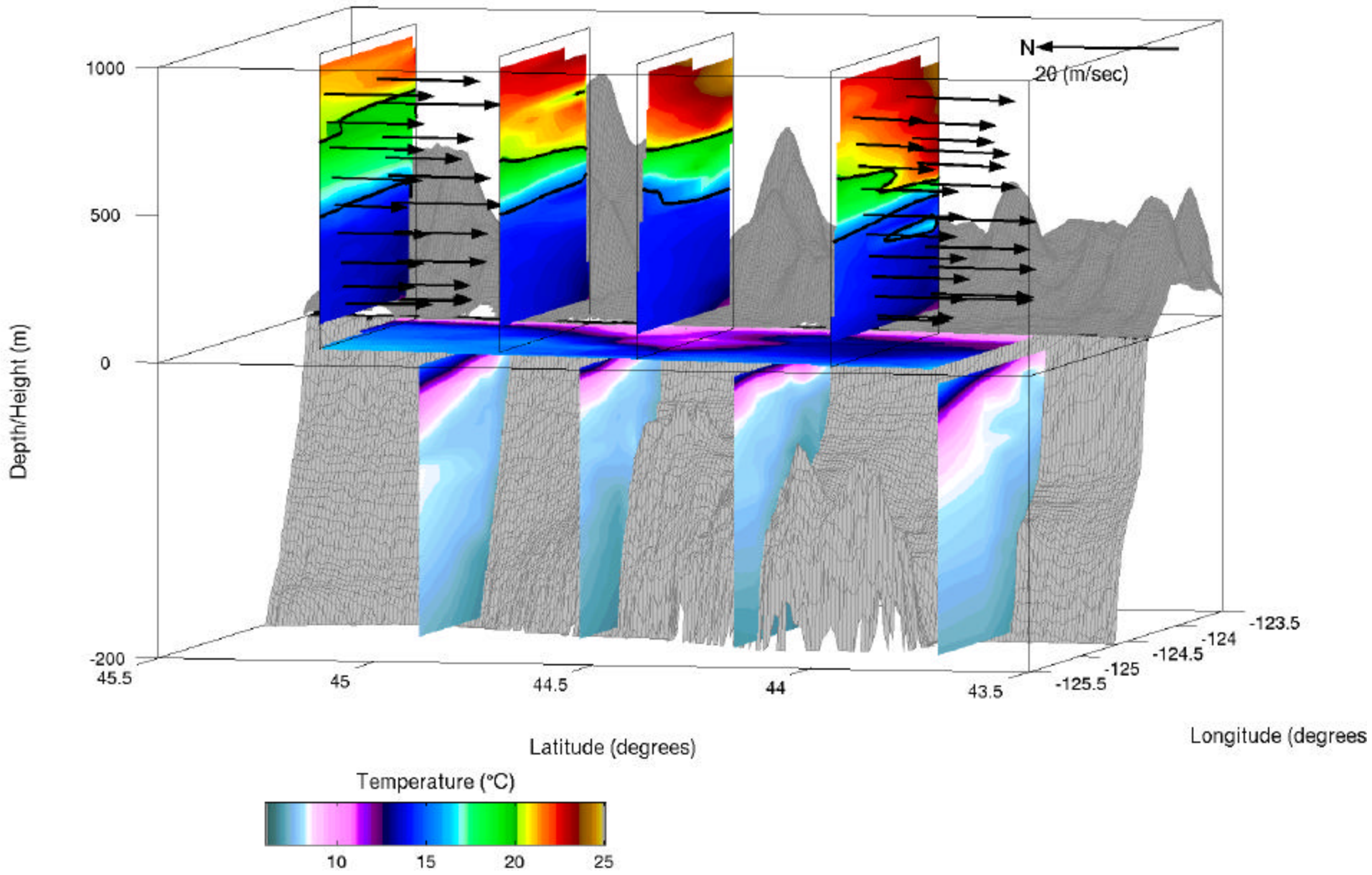
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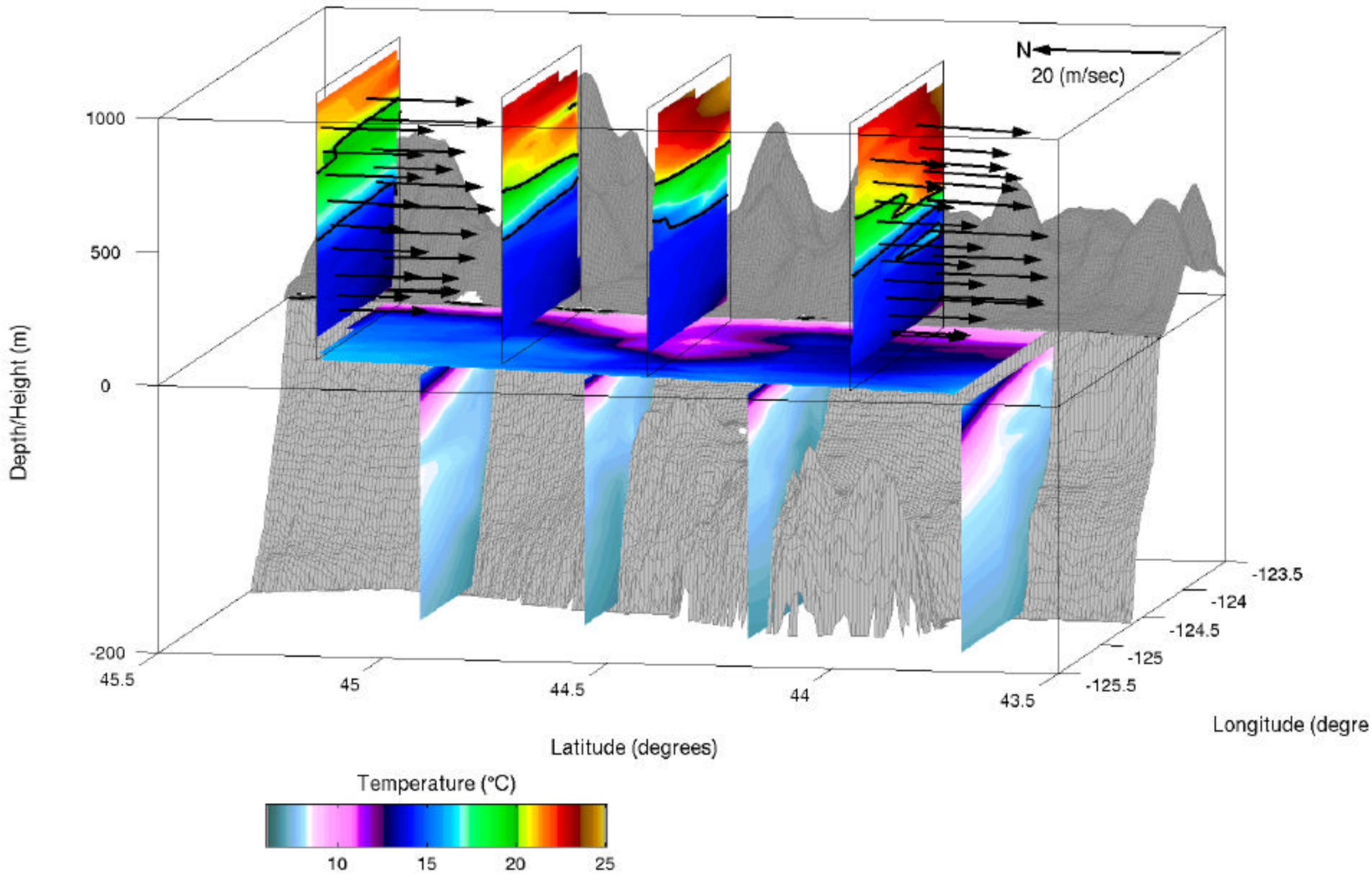
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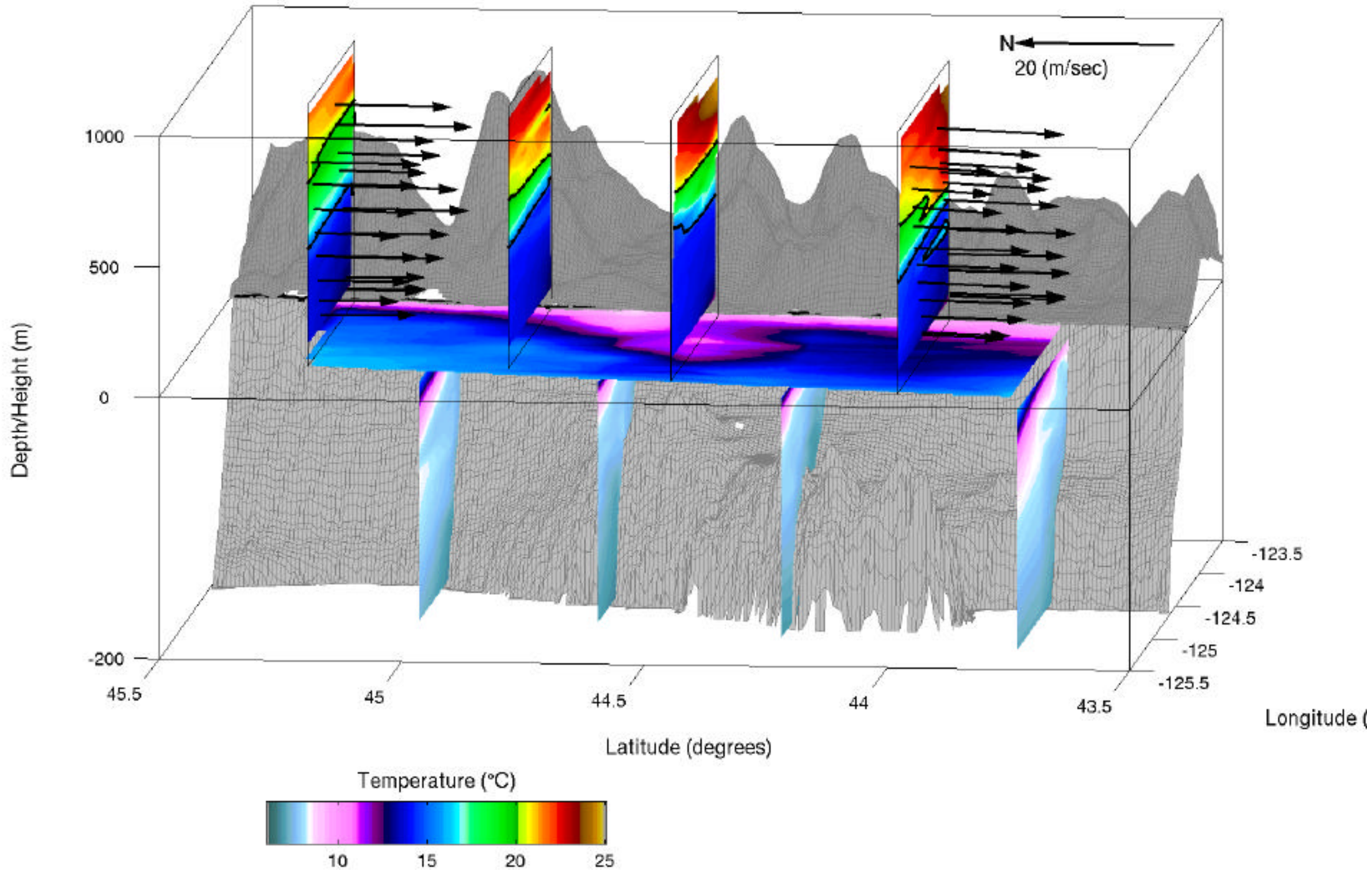
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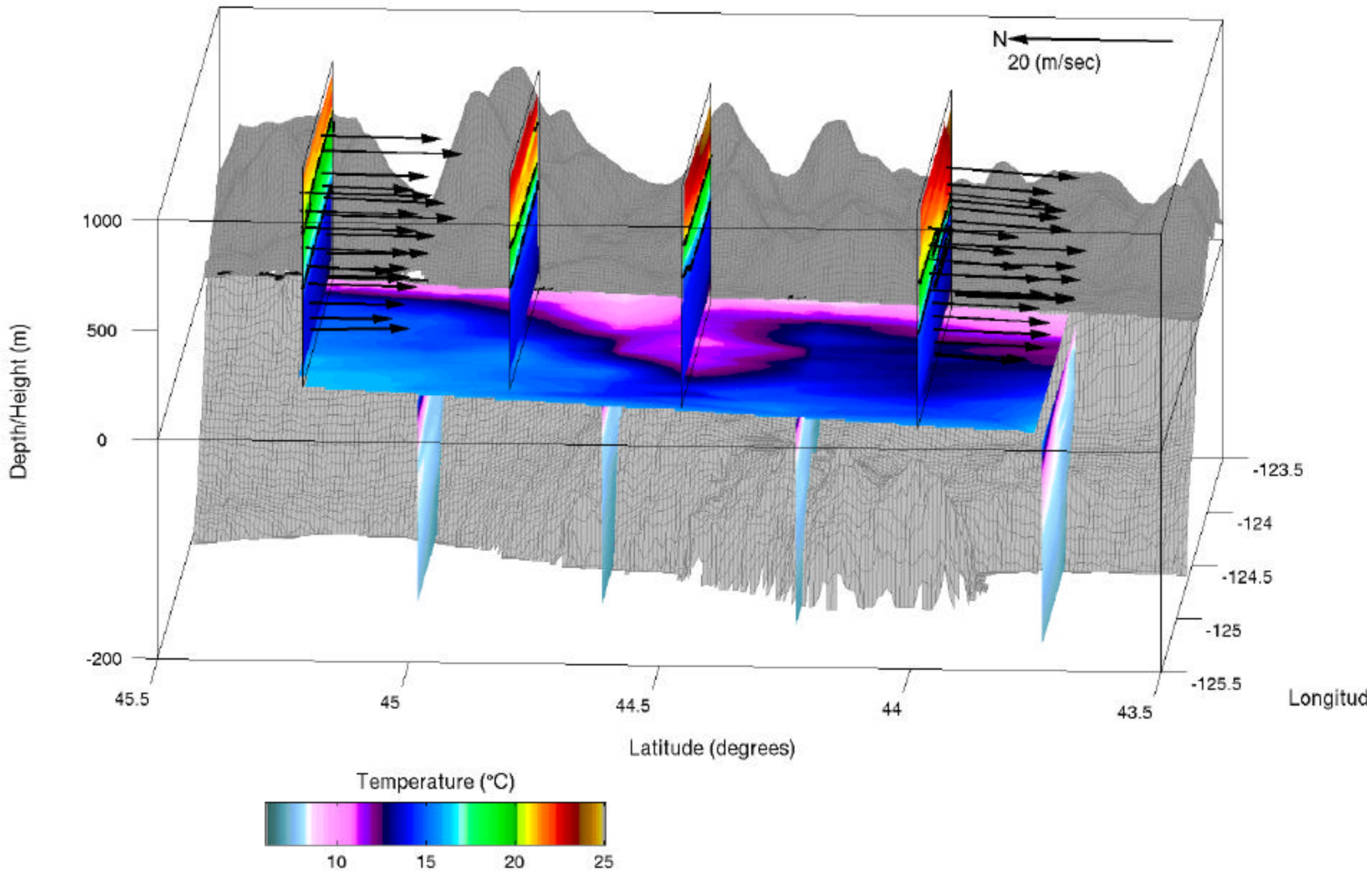
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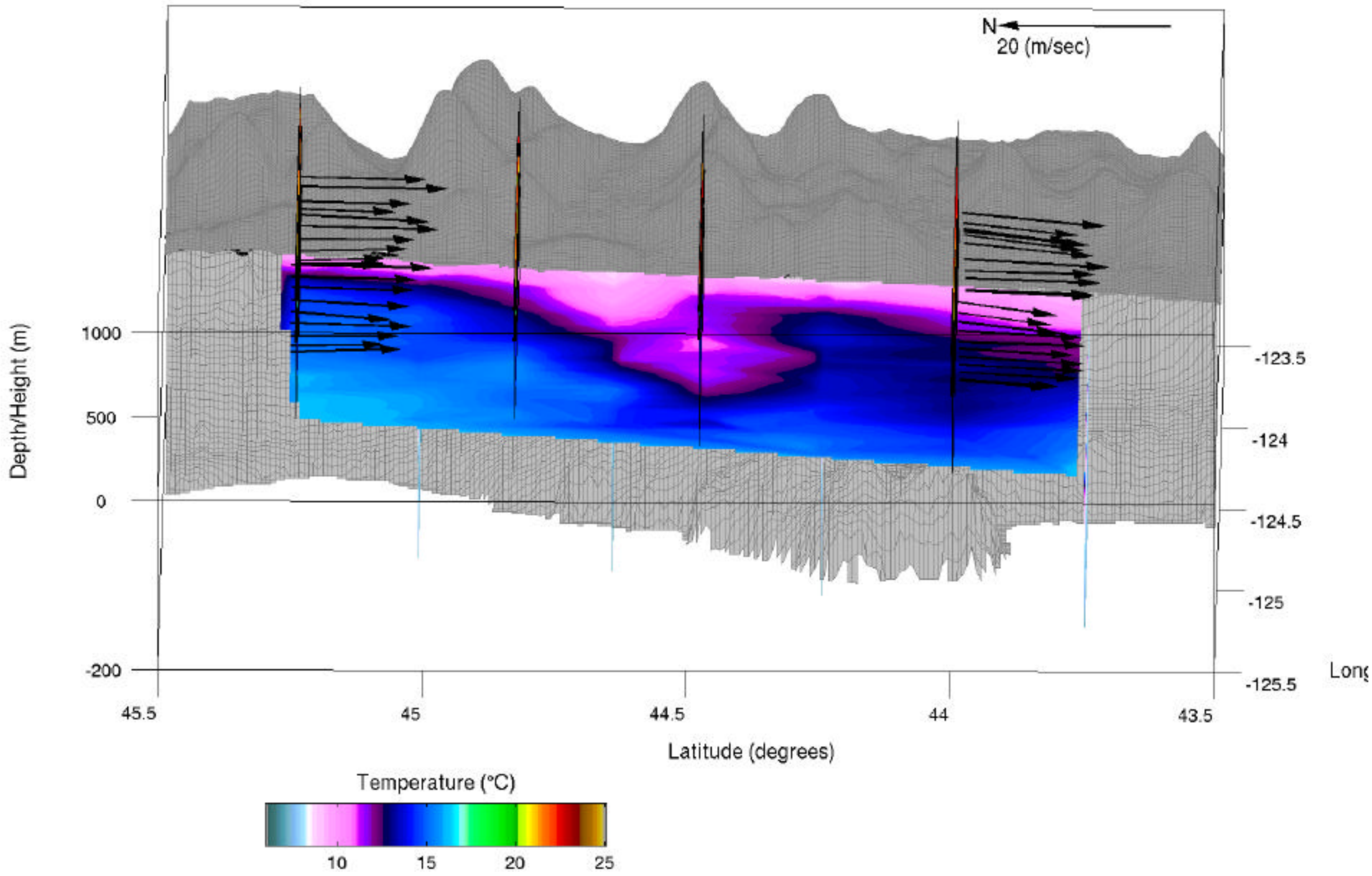
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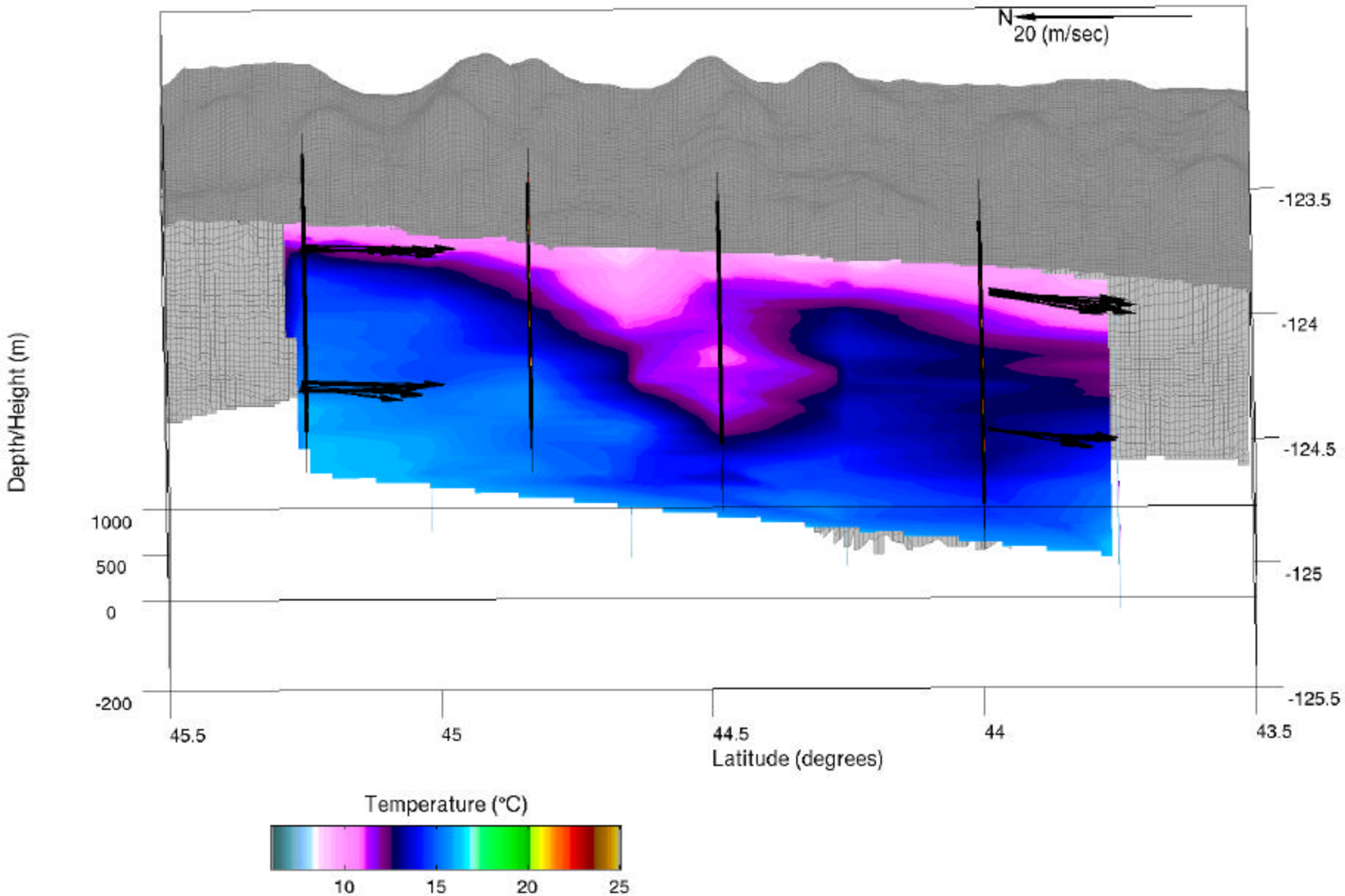
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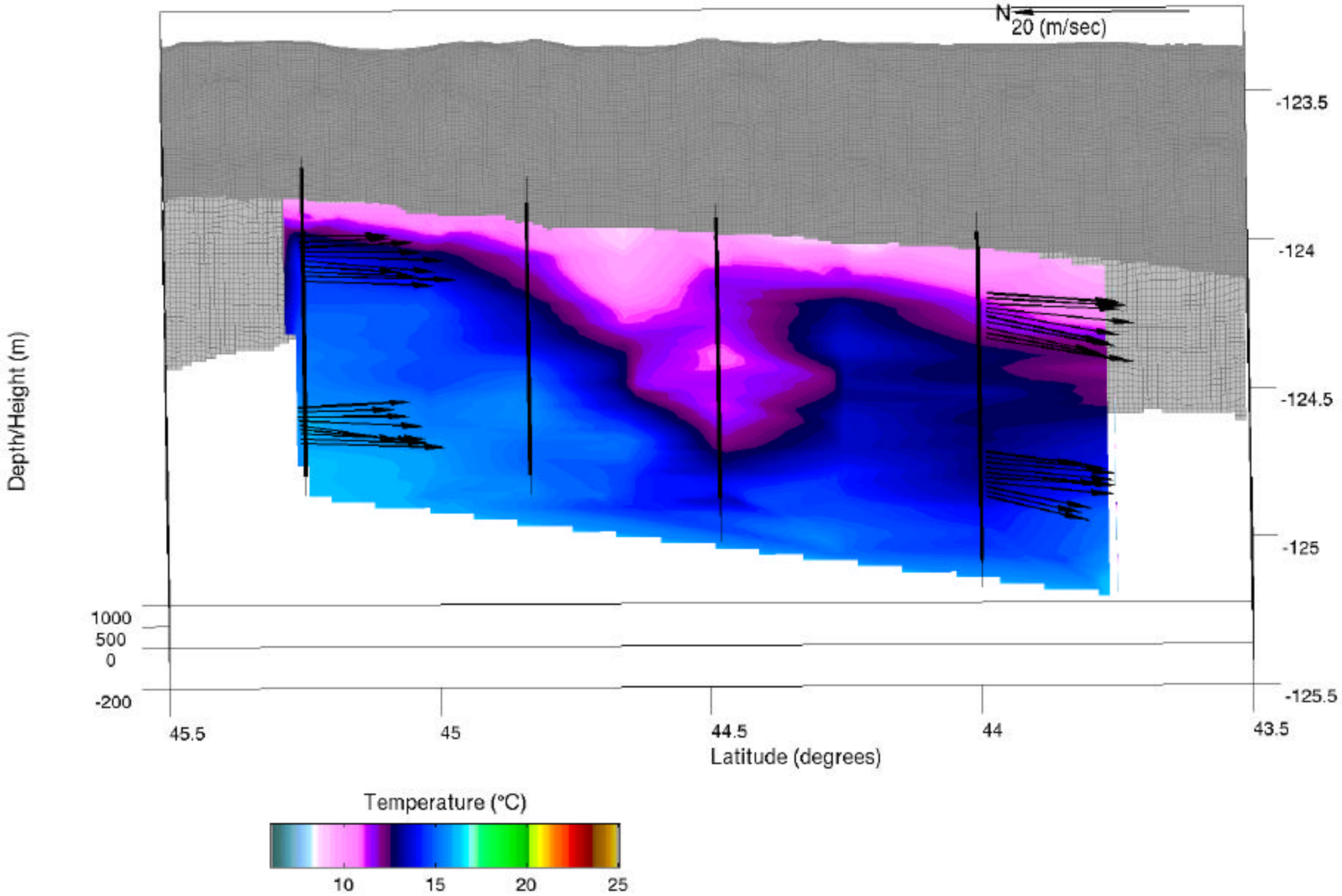
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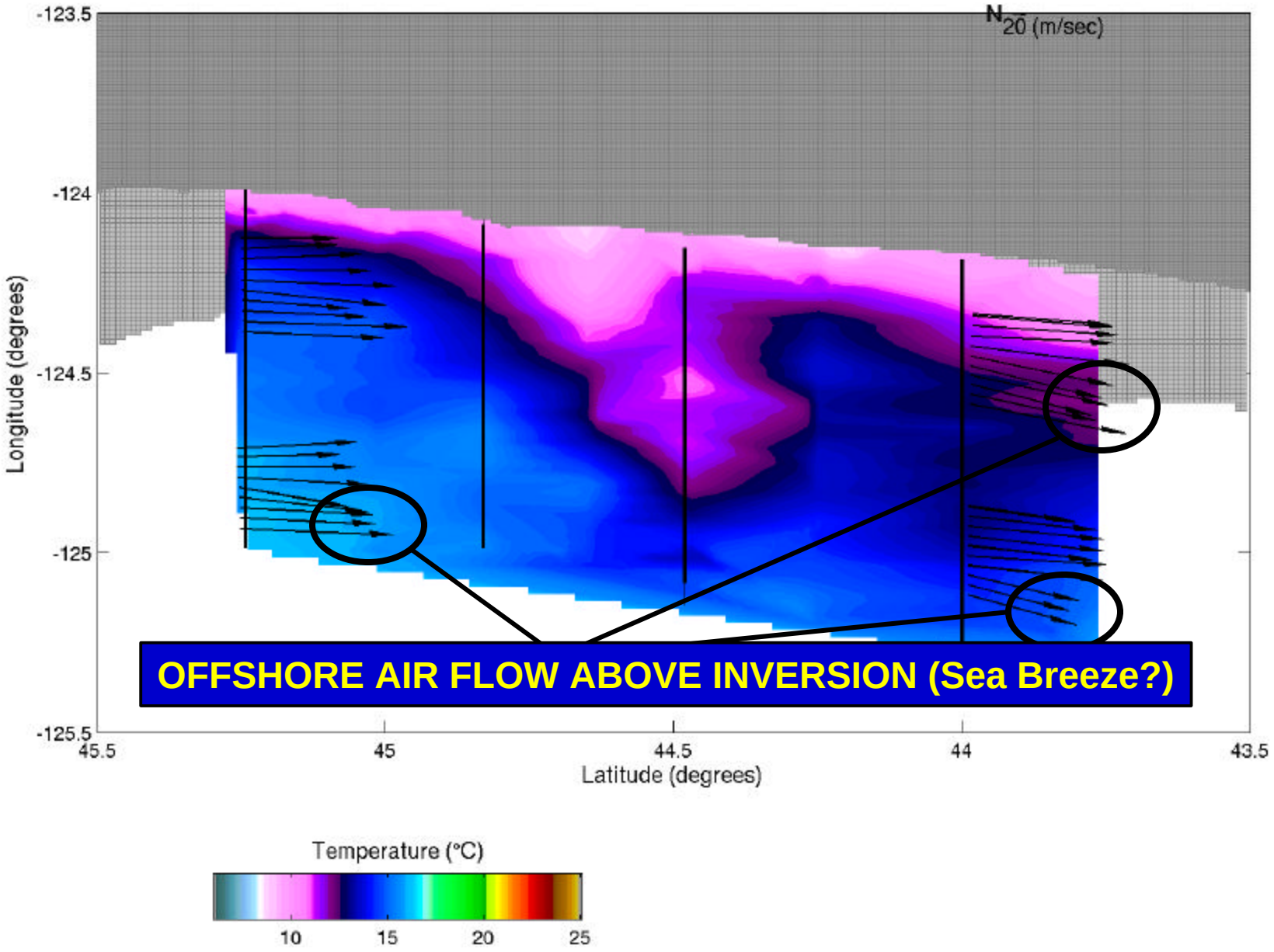
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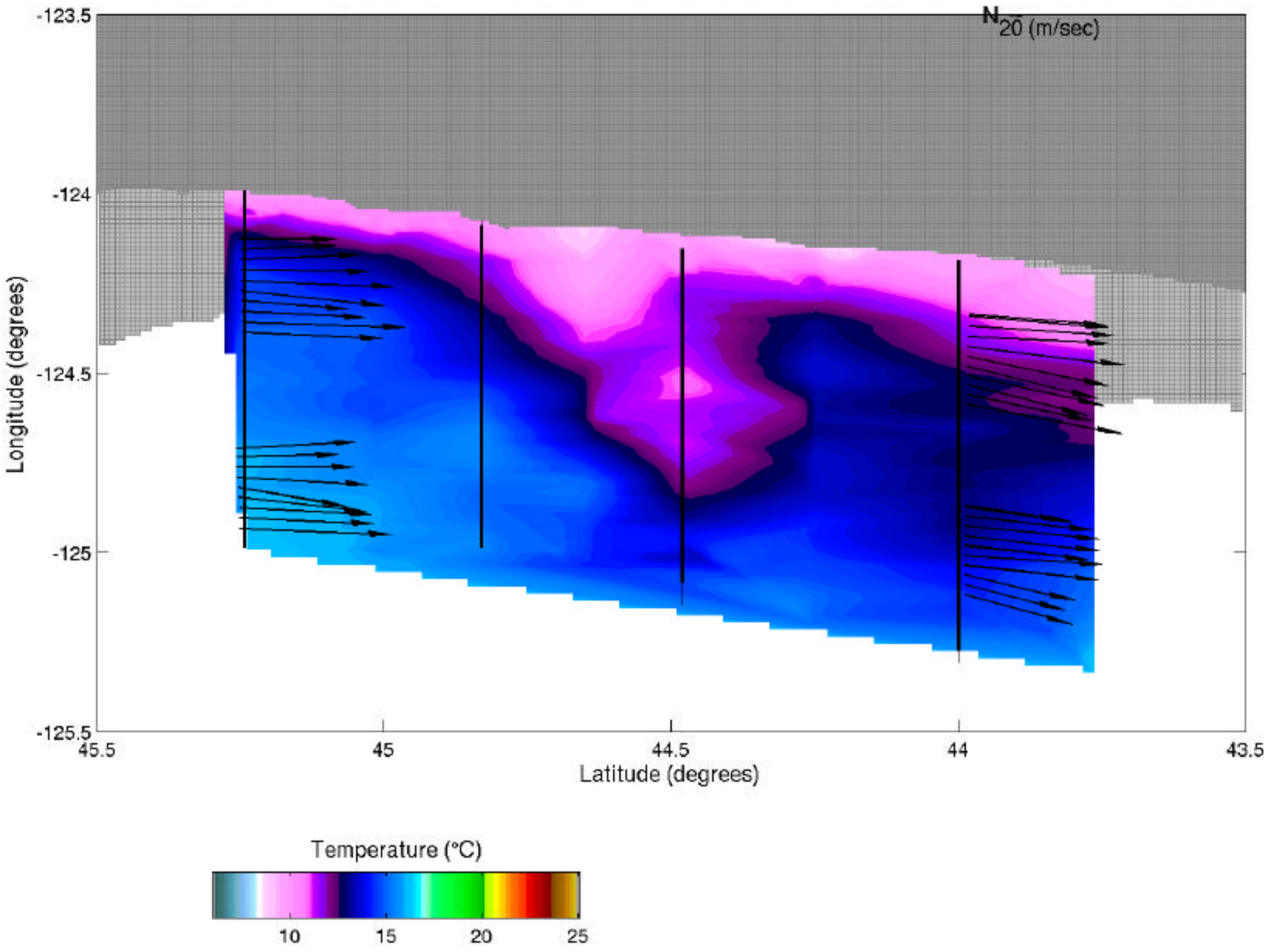
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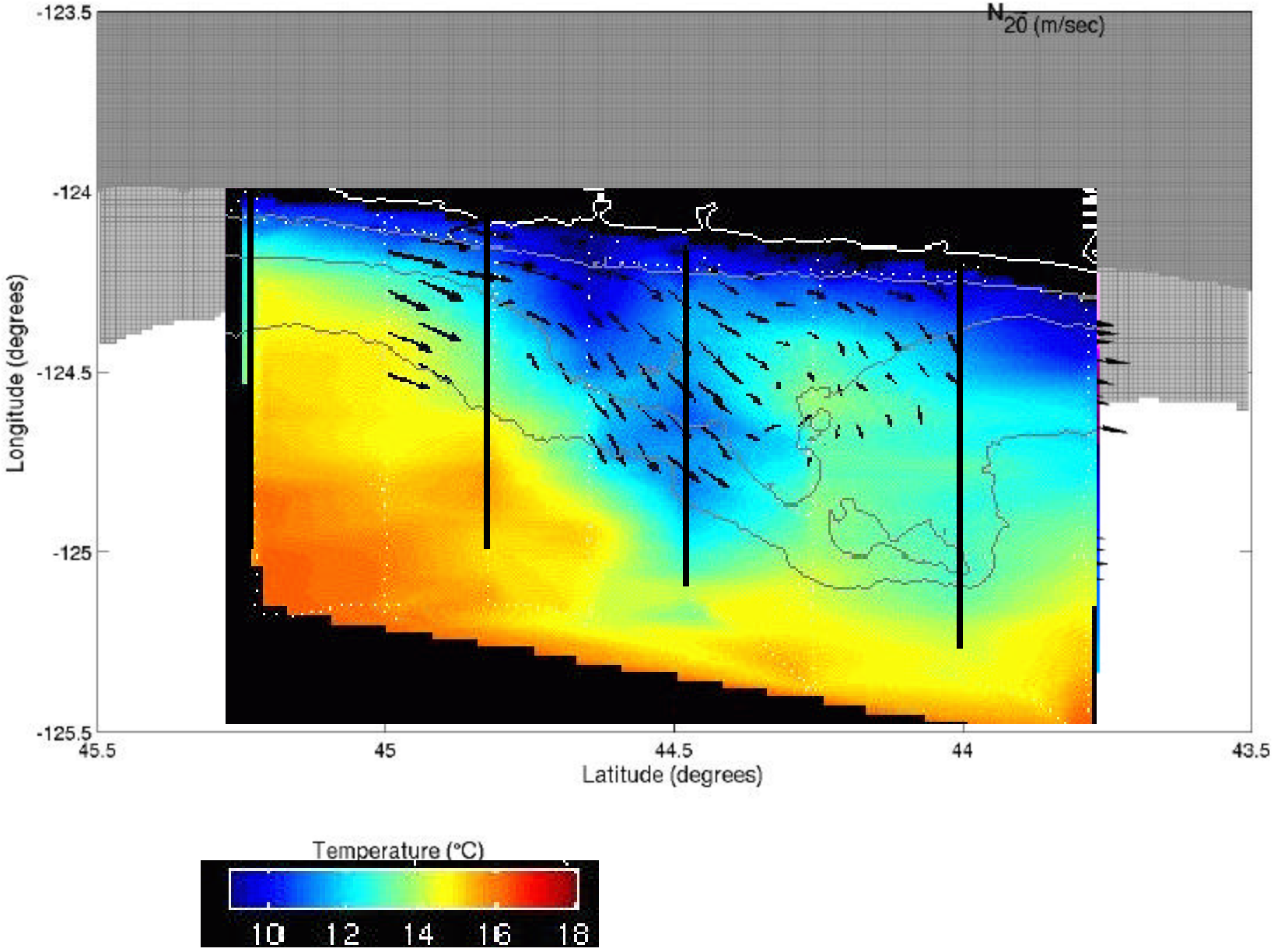
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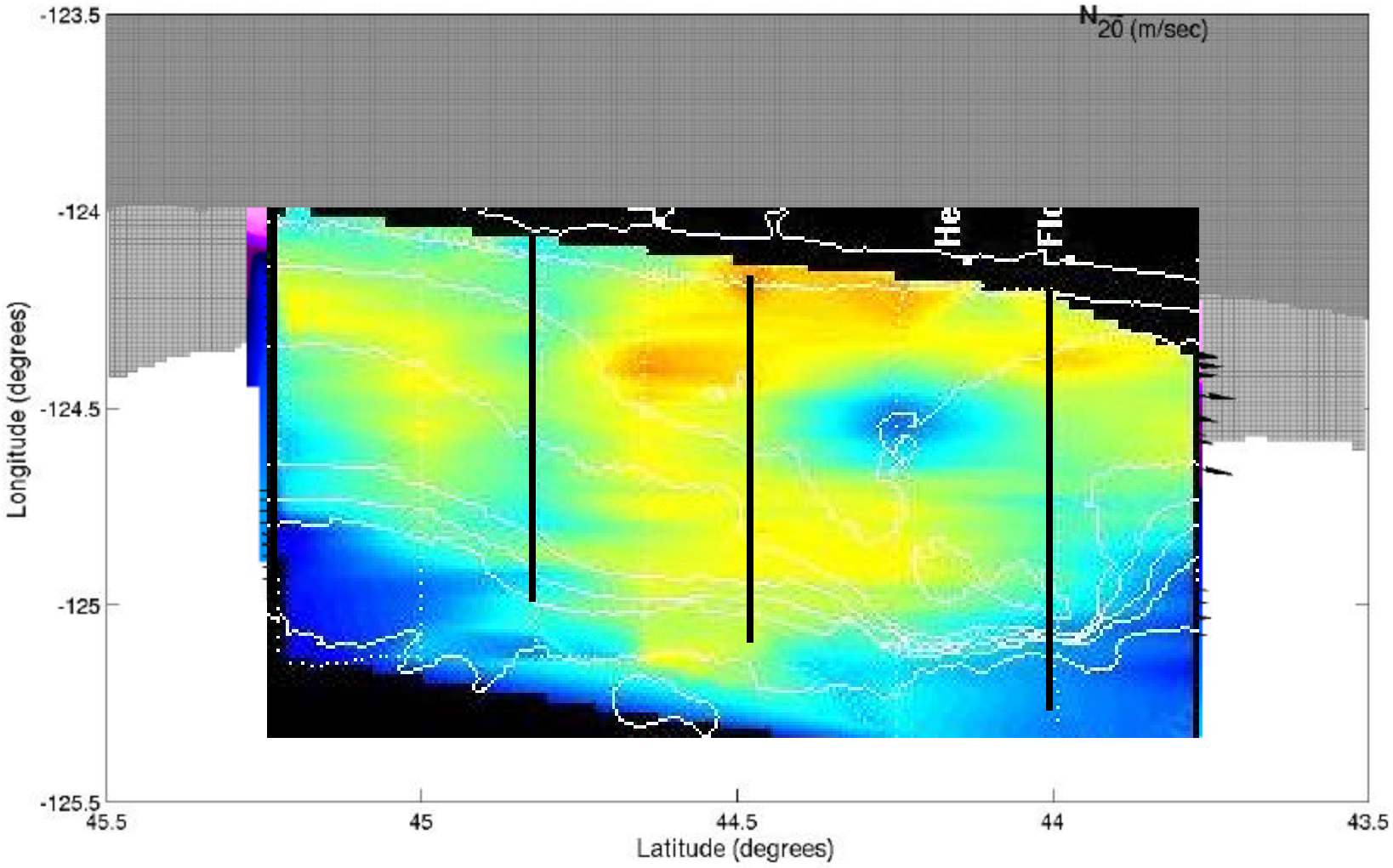
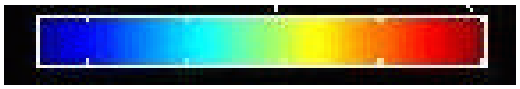
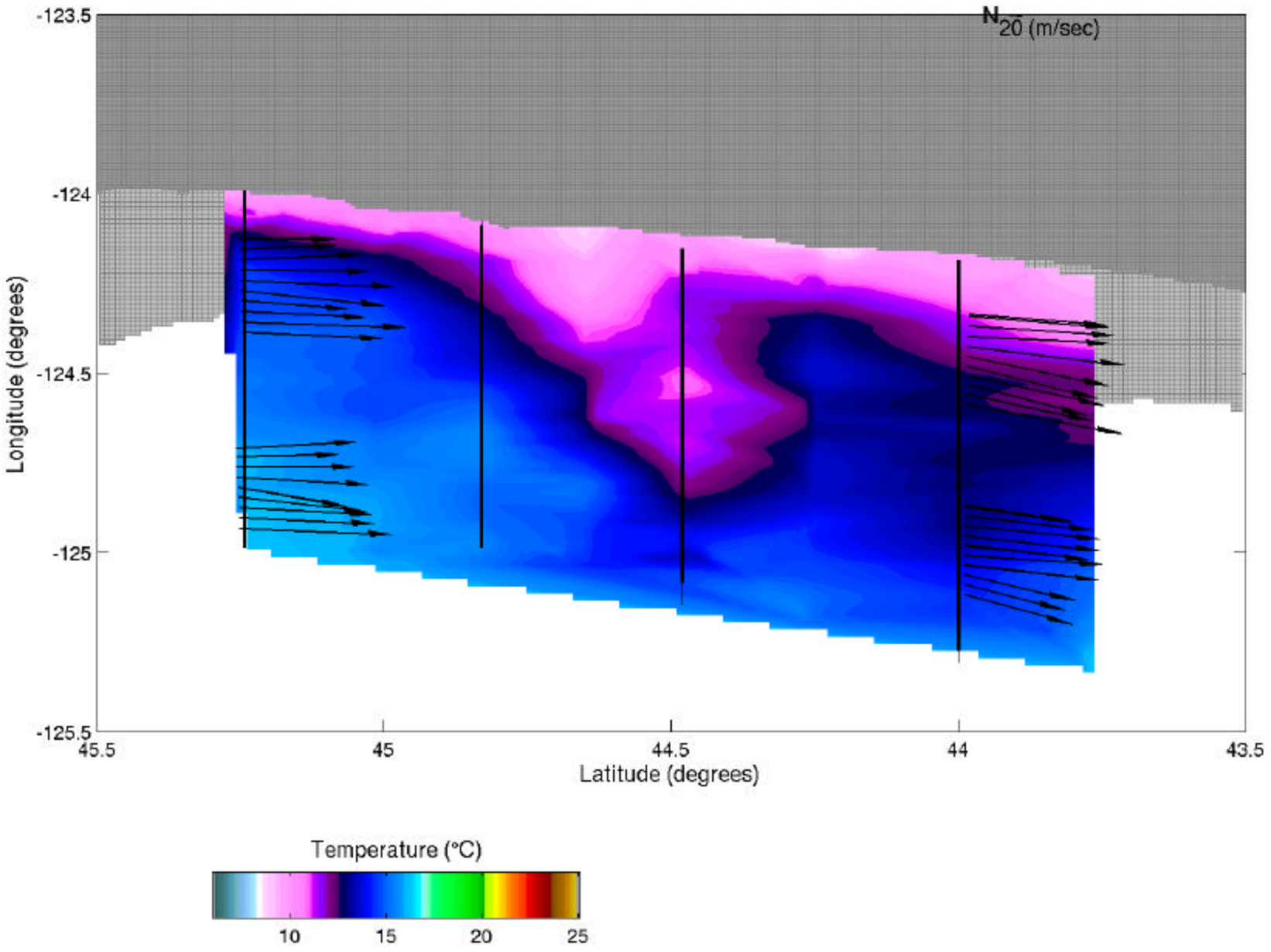
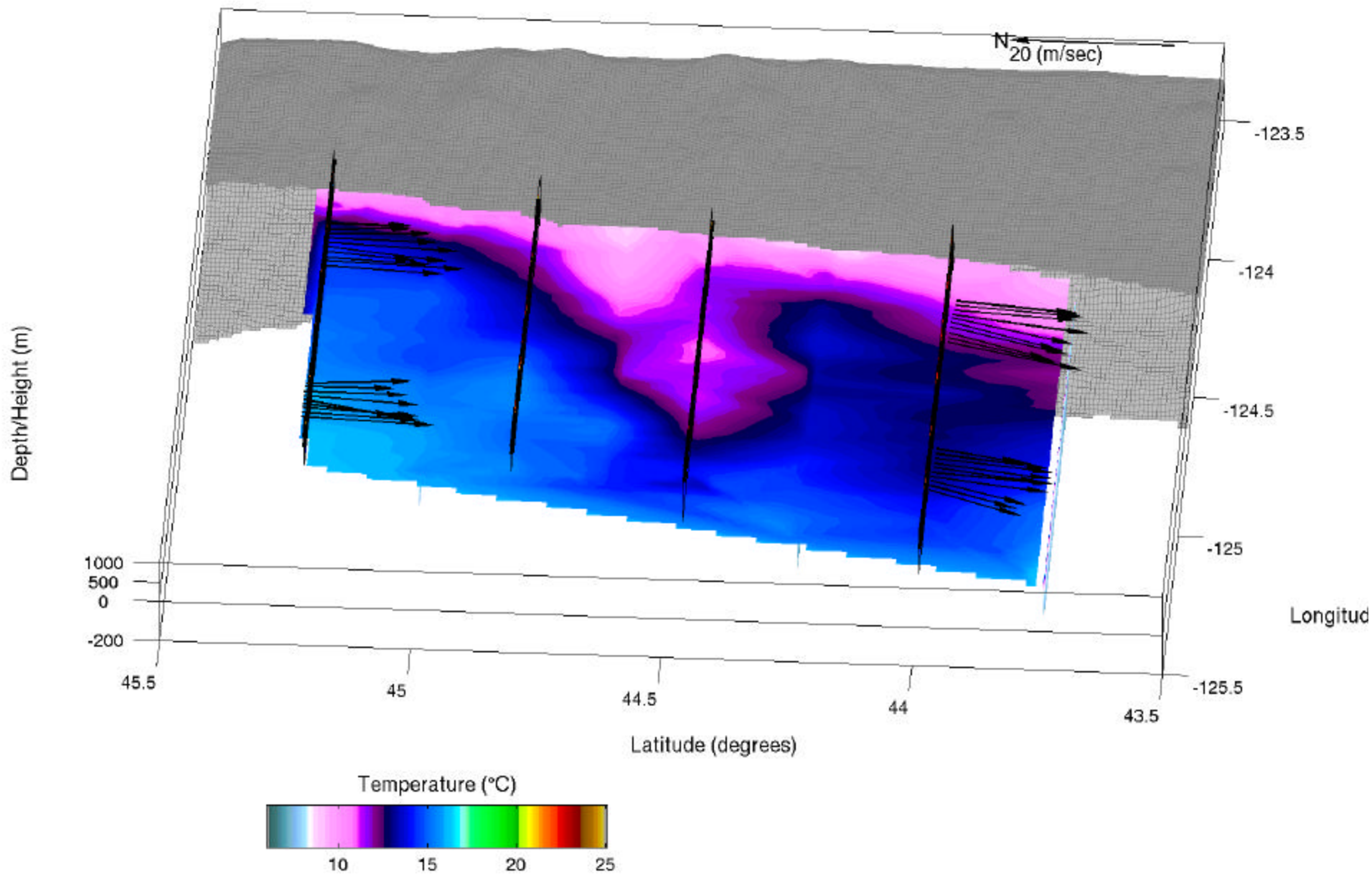
10
12
14
16
18



Chlorophyll (relative scale)




N20 (m/sec)
-123.5
-124
-124.5
-125
-125.5
Longitude (degrees)
45.5
45
44.5
44
43.5
Latitude (degrees)
Temperature (°C)
10
15
20
25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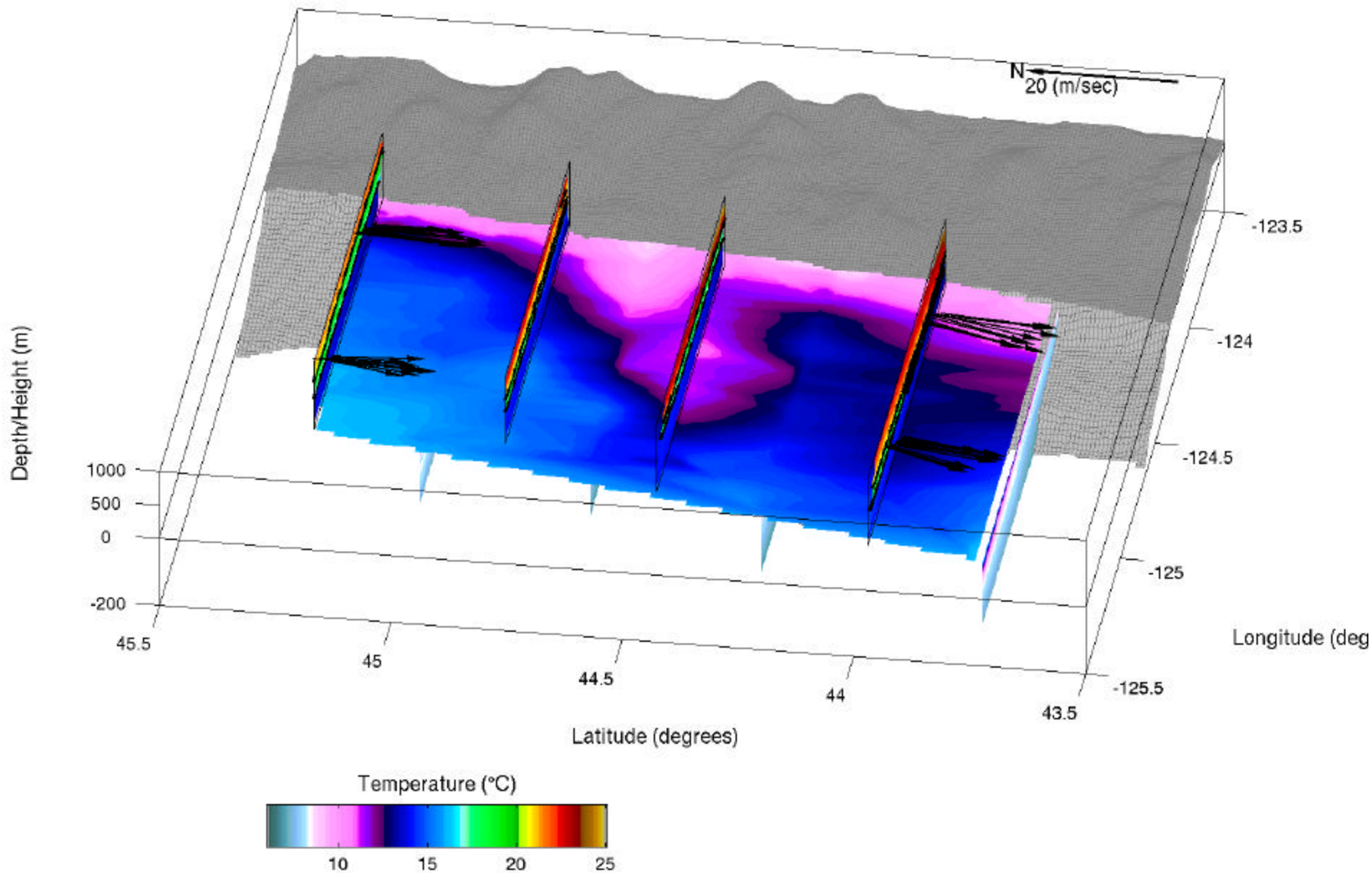
0
-200
45.5
45
44.5
44
43.5
Latitude (degrees)
-123.5
-124
-124.5
-125
-125.5
Longitud
Temperature (°C)
10
15
20
25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43.5
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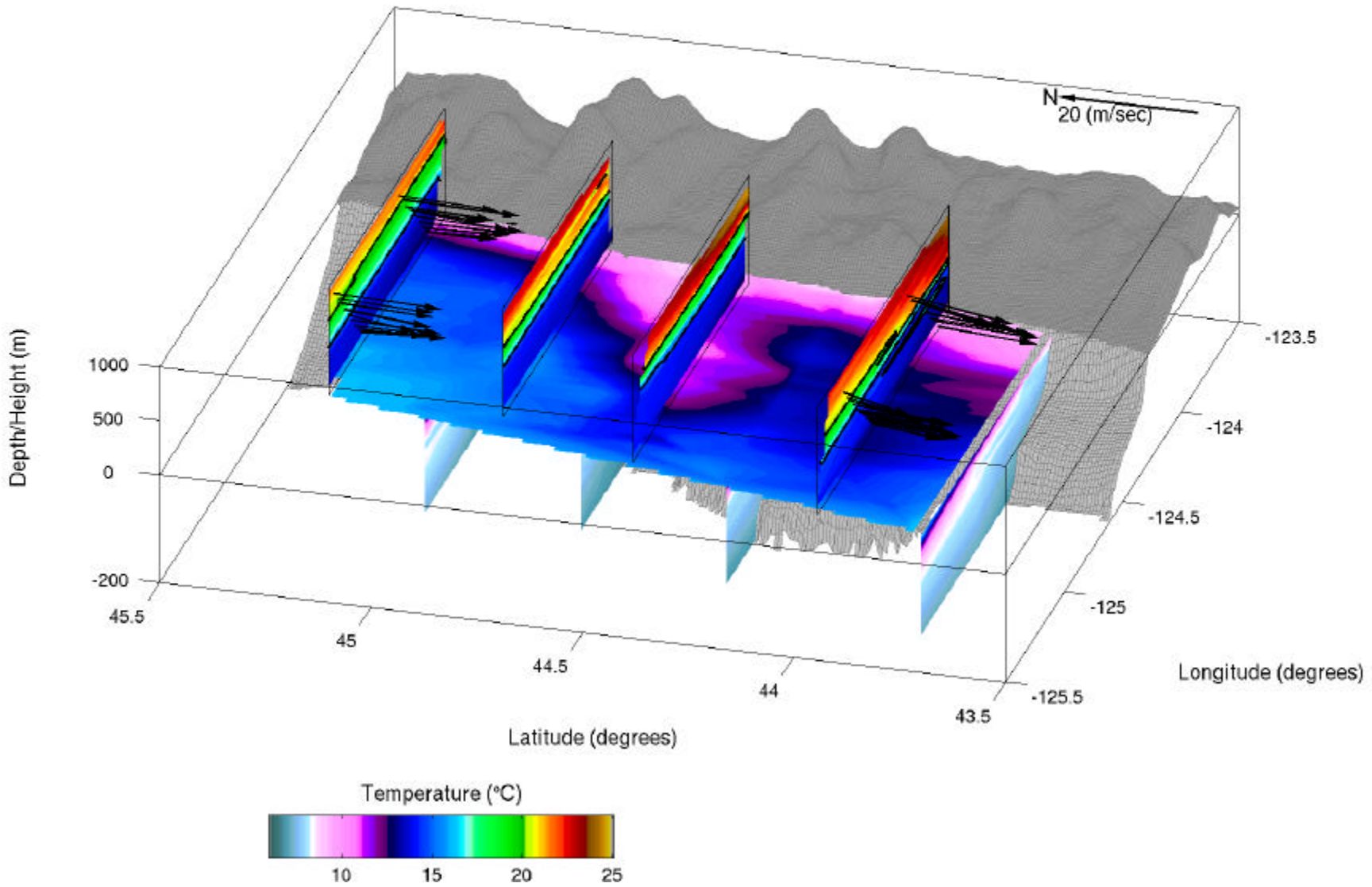
-124
-124.5
-125
-125.5
Longitude (deg
Temperature (°C)
10
15
20
25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Longitude (degrees)
Temperature (°C)
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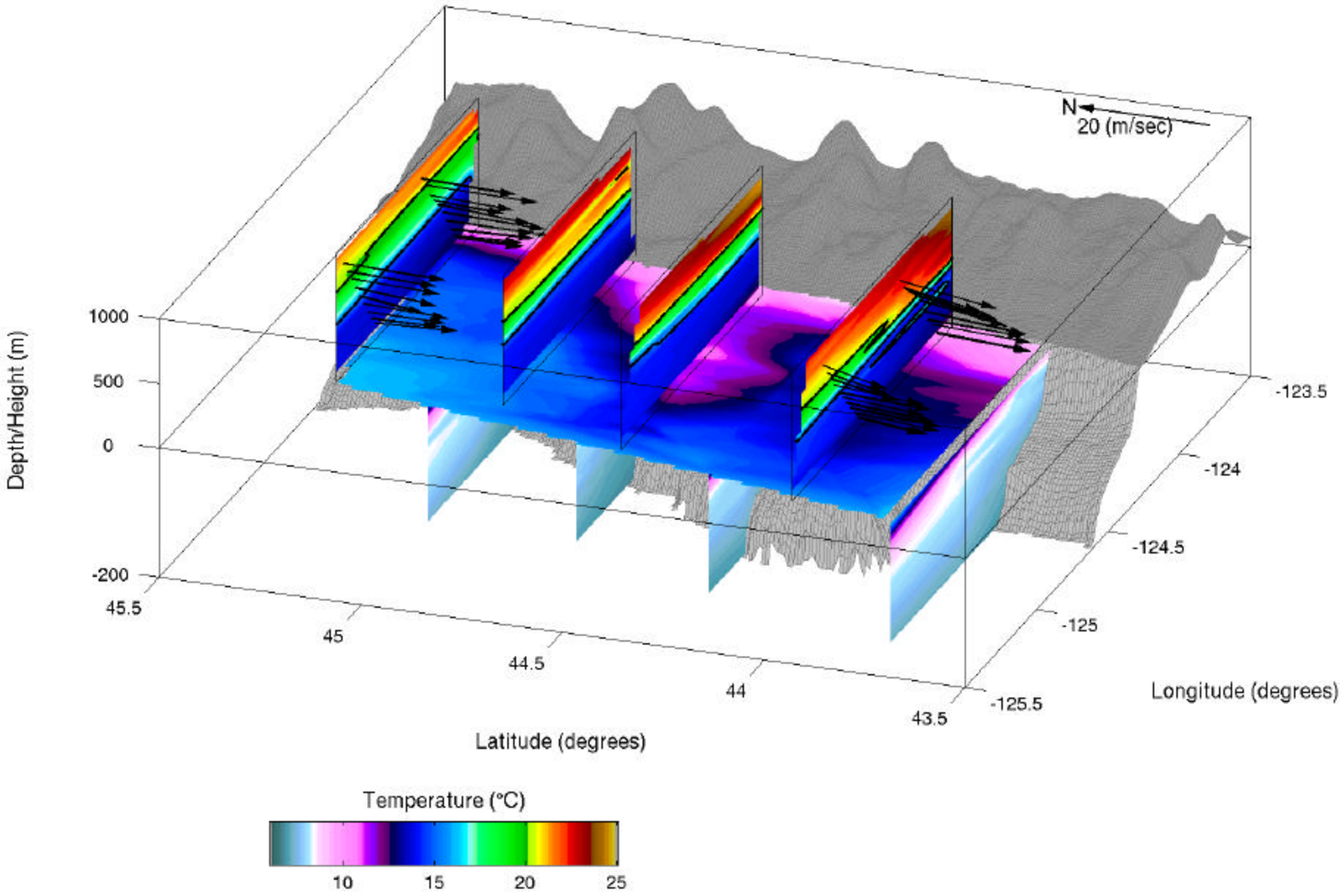
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Longitude (degrees)
Temperature (°C)
10
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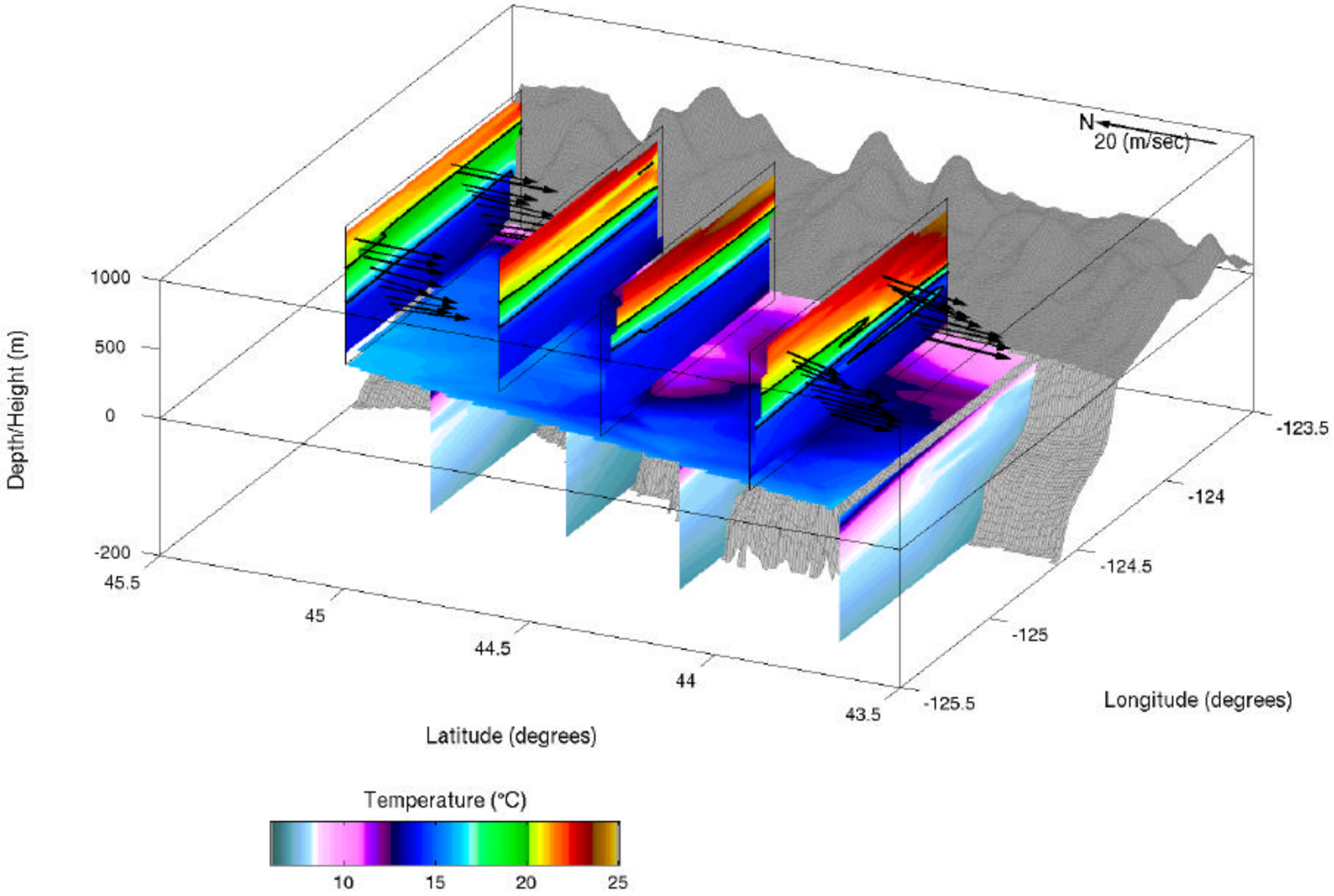
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Longitude (degrees)
Temperature (°C)
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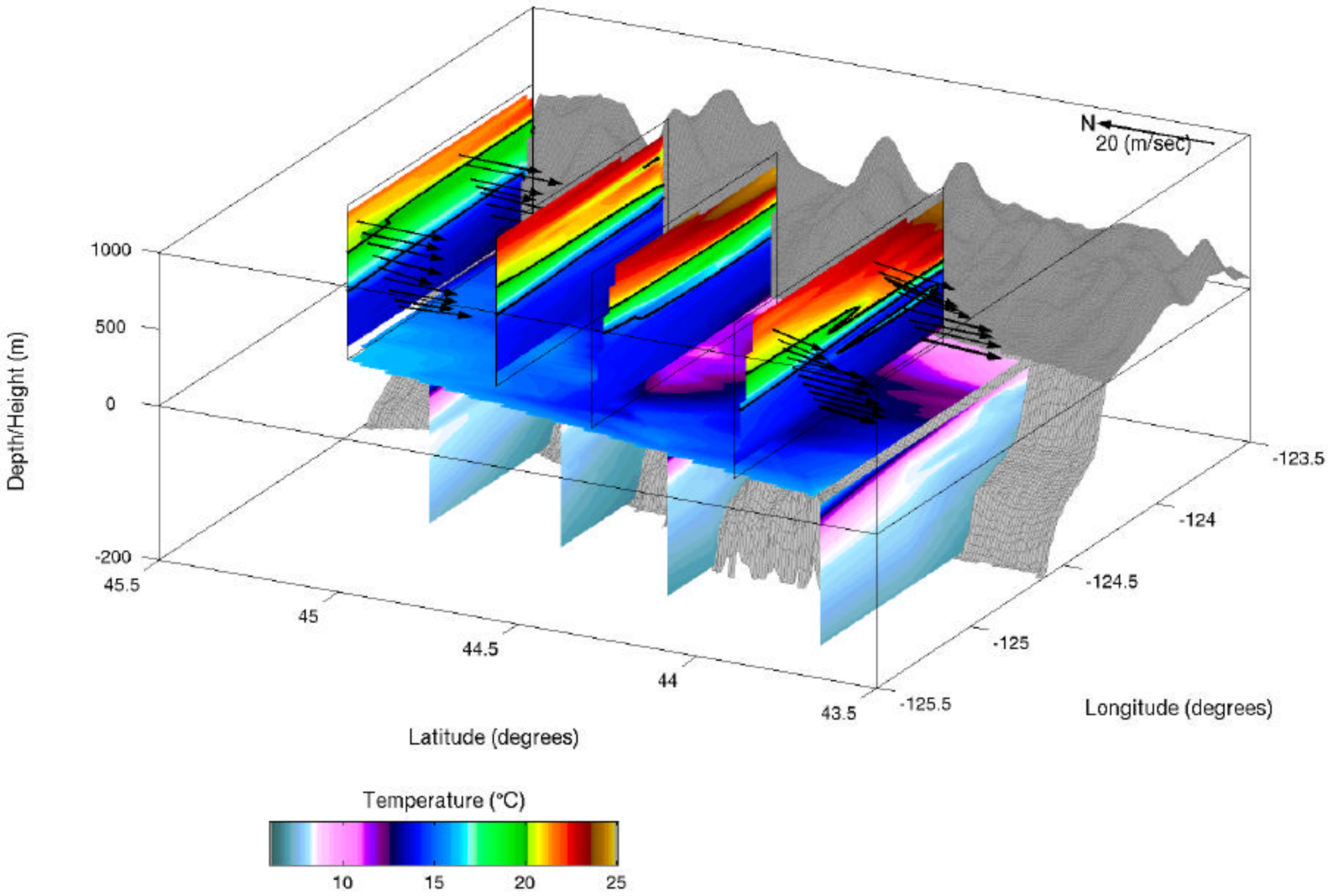
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Temperature (°C)
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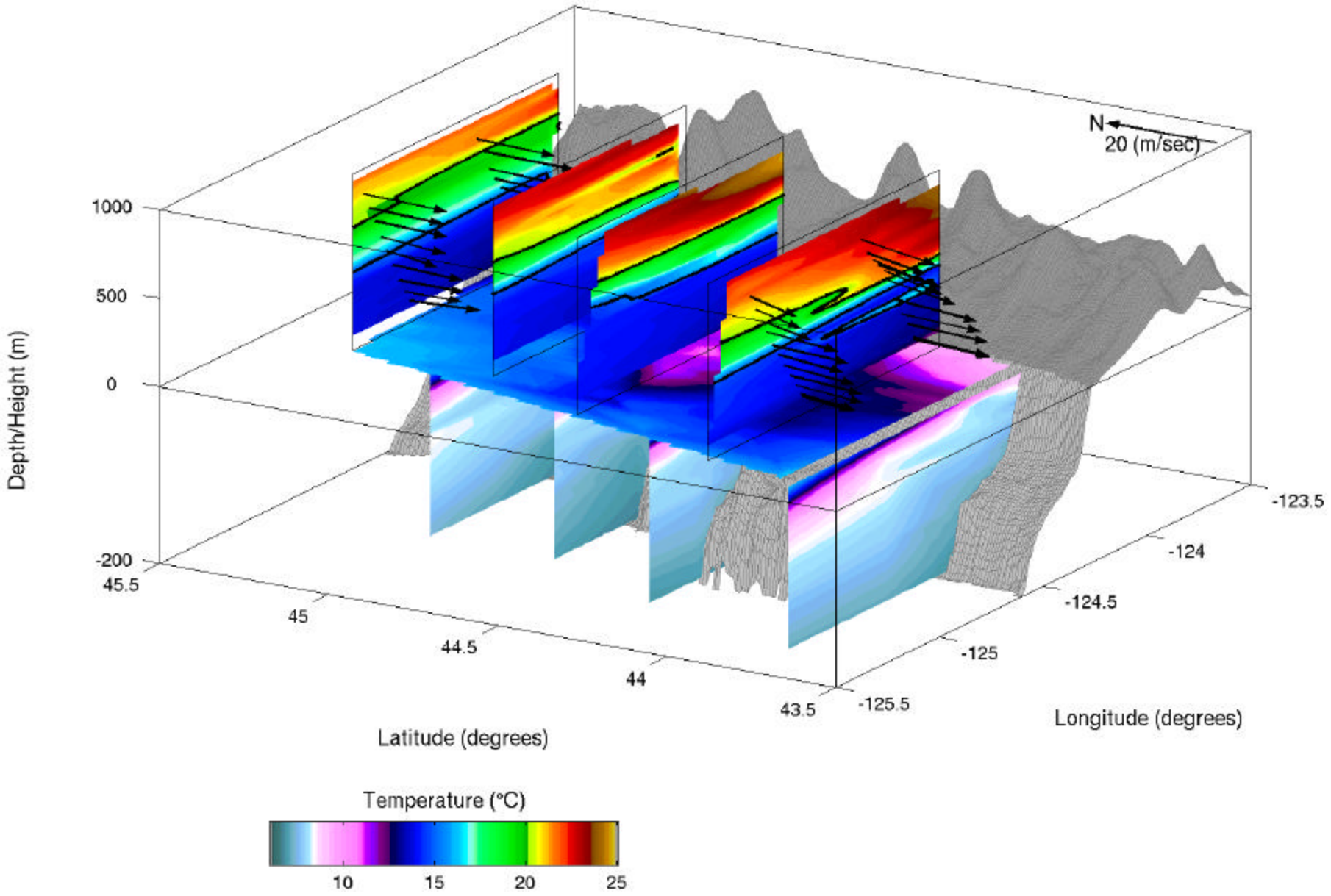
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Depth/Height (m)
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Longitude (degrees)
Temperature (°C)
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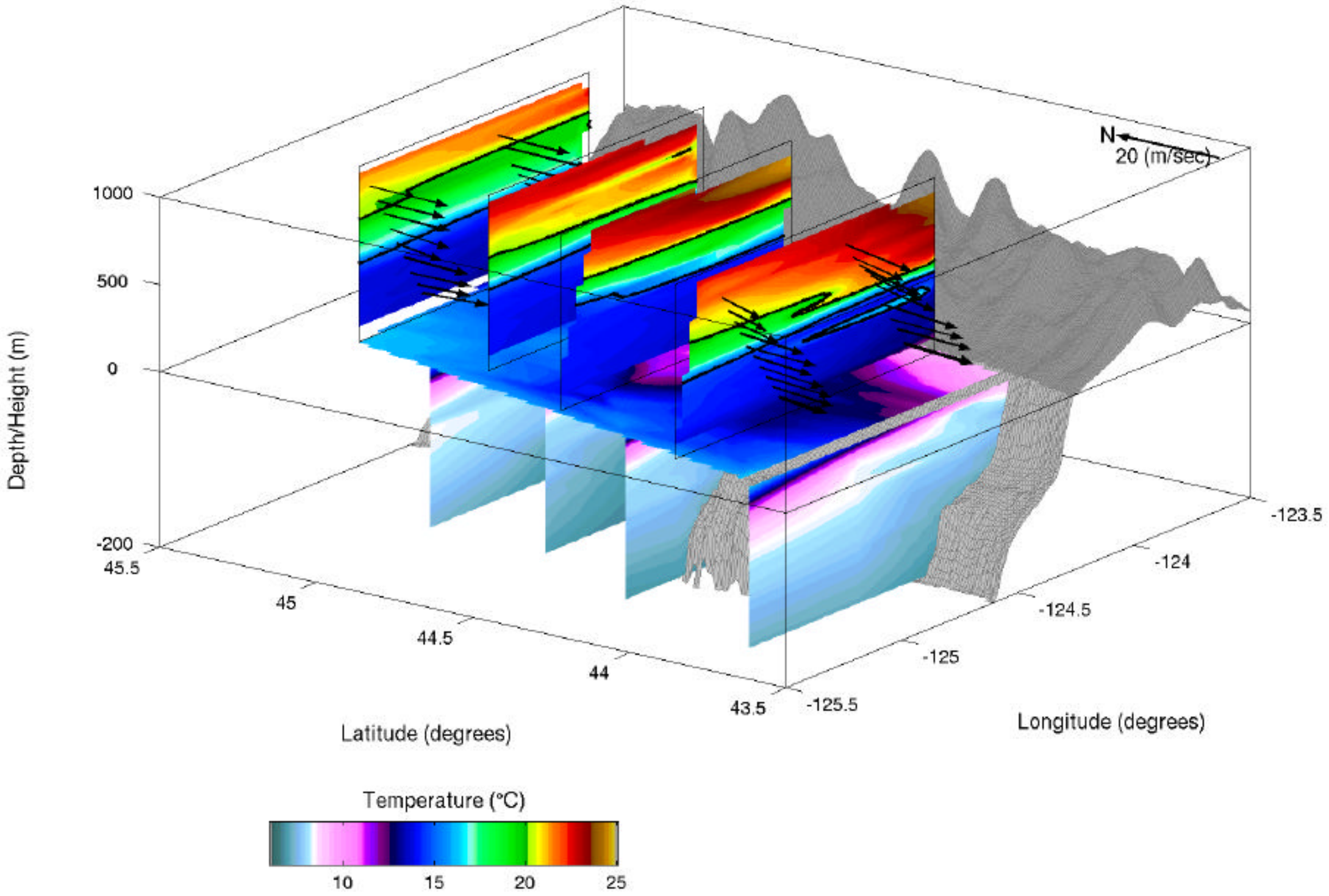
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Longitude (degrees)
Temperature (°C)
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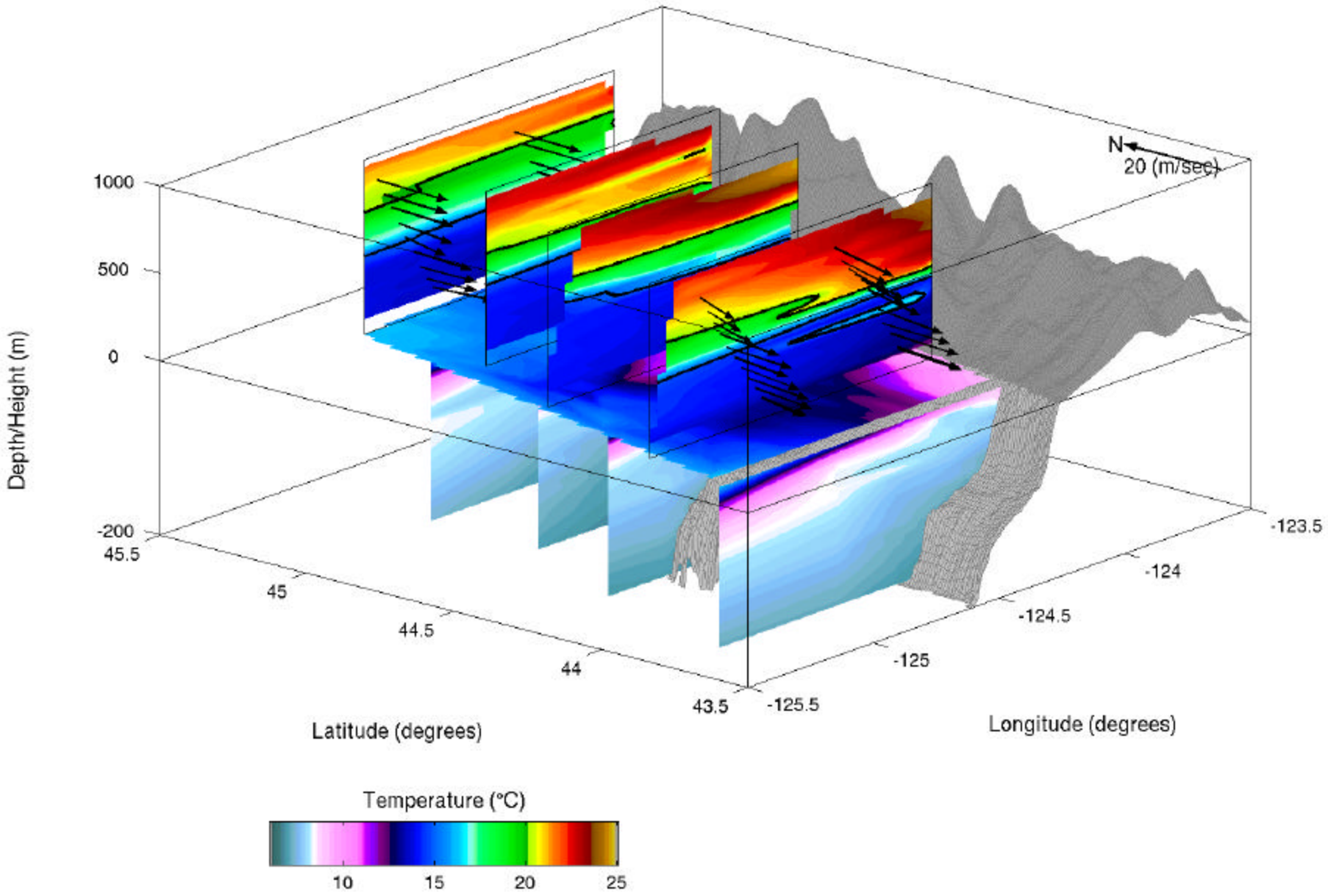
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Longitude (degrees)
Temperature (°C)
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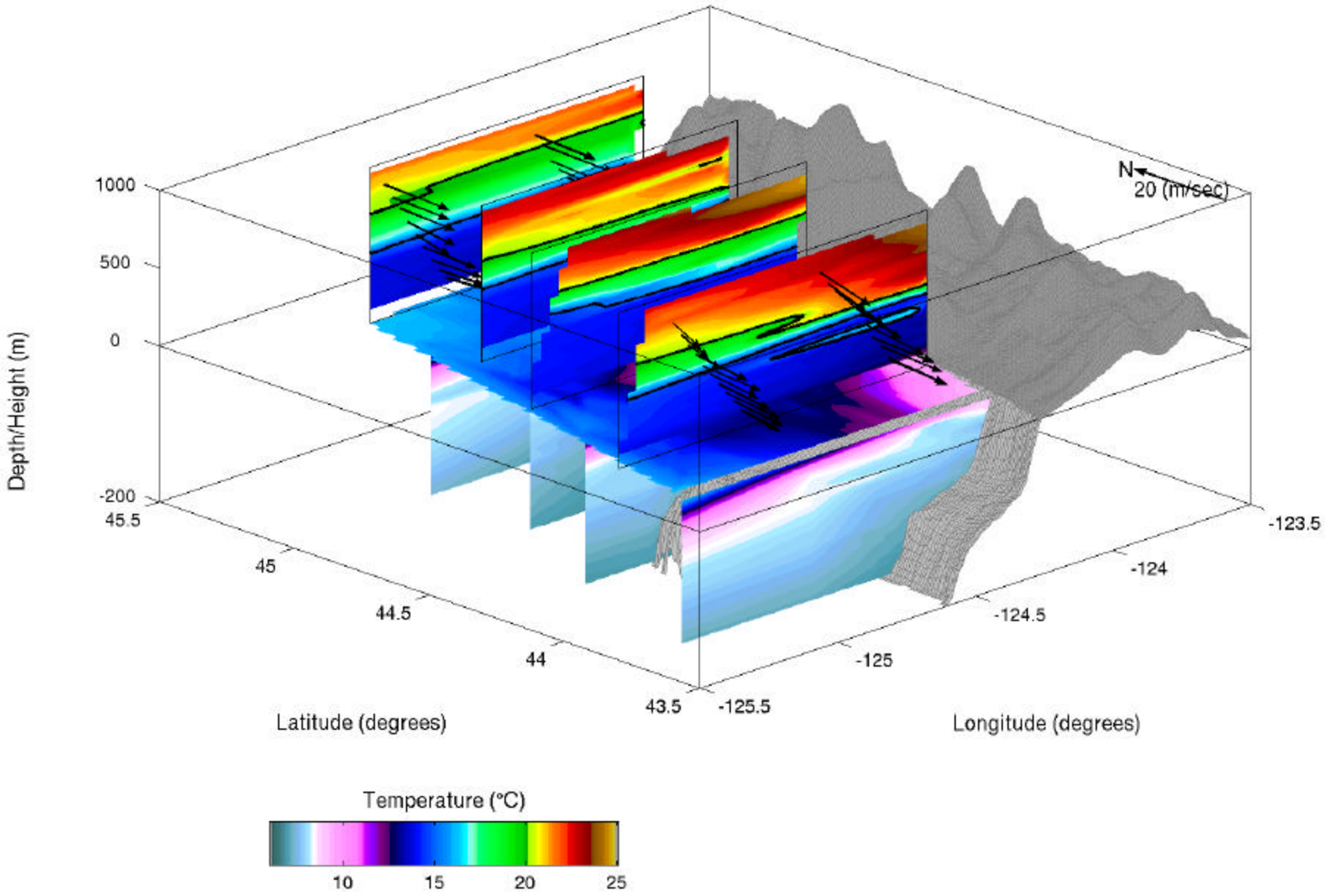
Depth/Height (m)
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Longitude (degrees)
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Temperature (°C)
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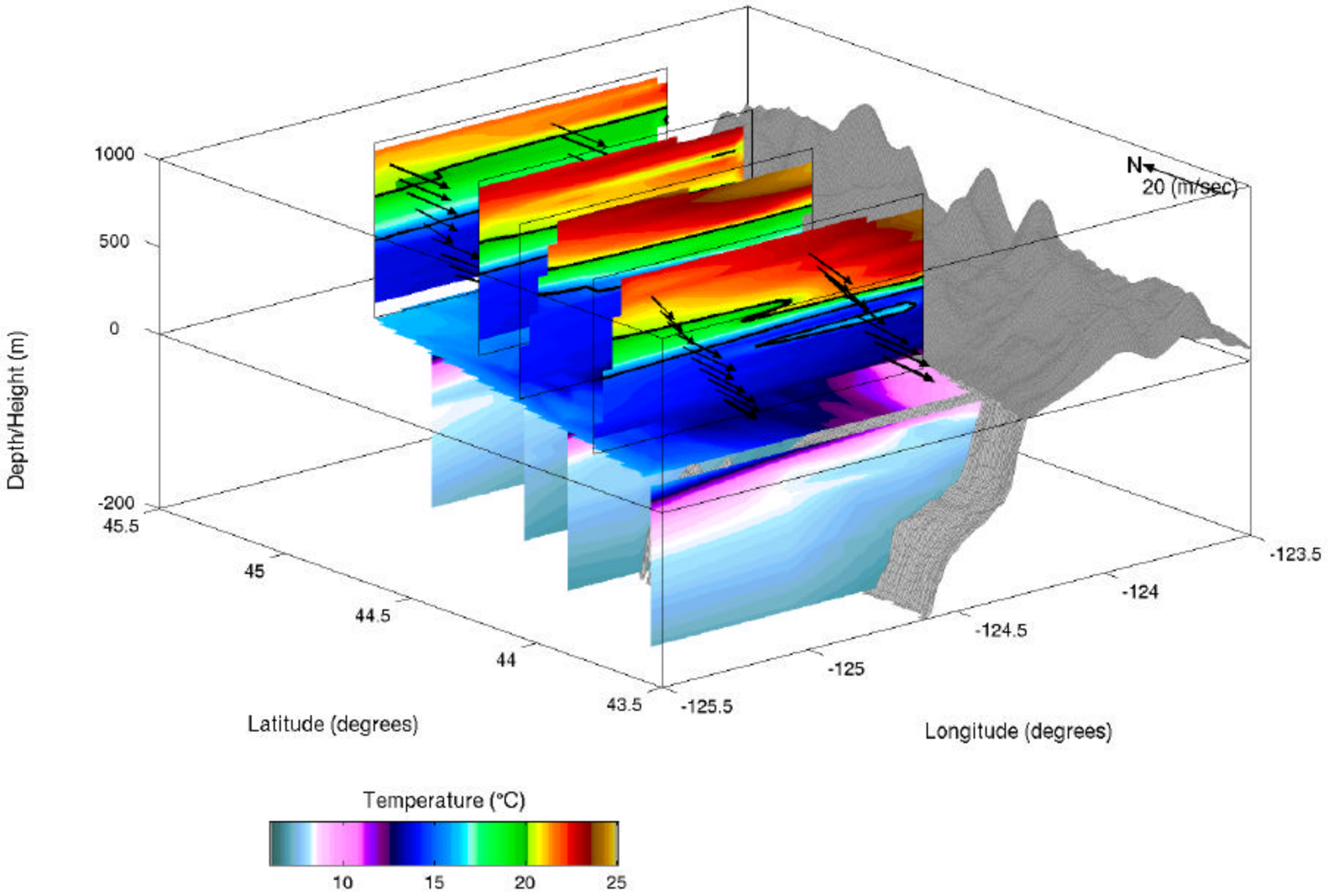
Depth/Height (m)
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Longitude (degrees)
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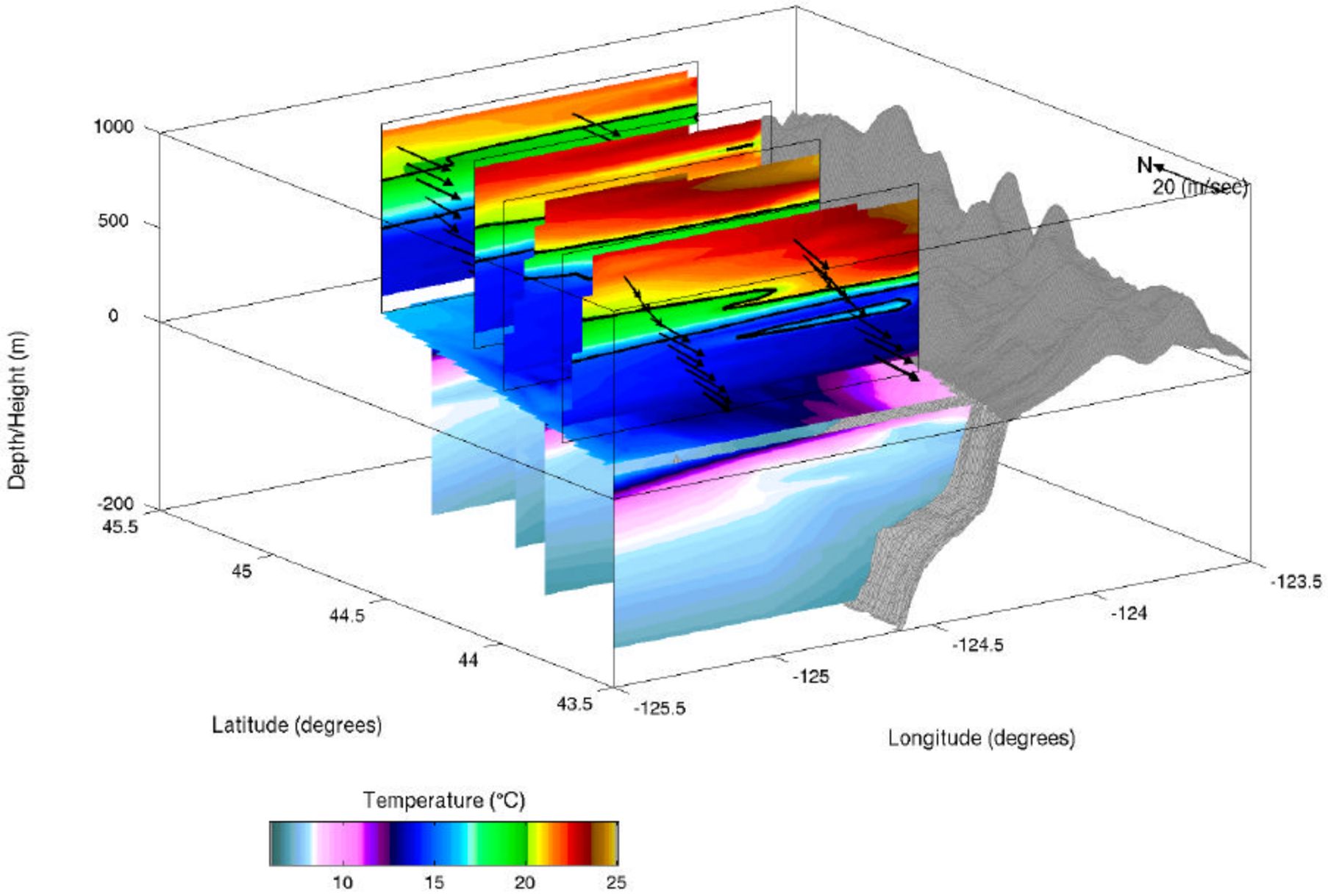
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Longitude (degrees)
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20 (m/sec)
Temperature (°C)
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Thank You

SCOAR