

# Deep Neural Network for SYM-H Forecasting aided by ACE's SWICS plasma data

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## Contents of this file

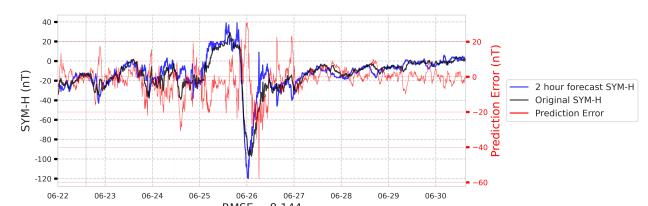
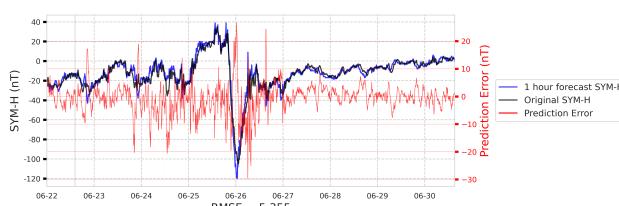
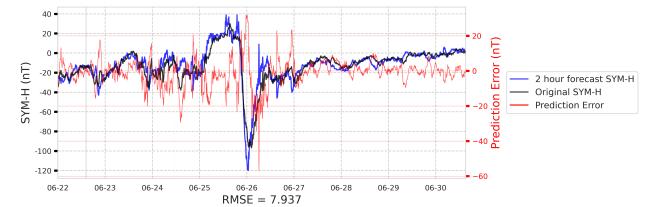
1. Figures S1 to S17

## Introduction

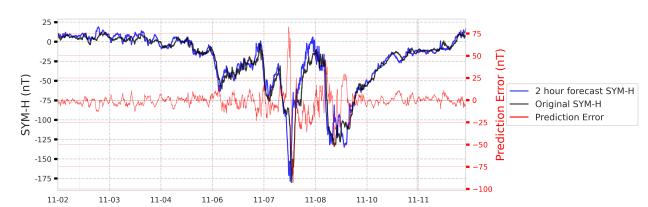
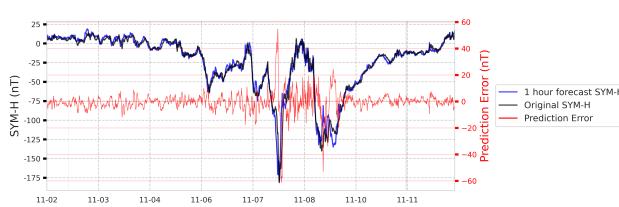
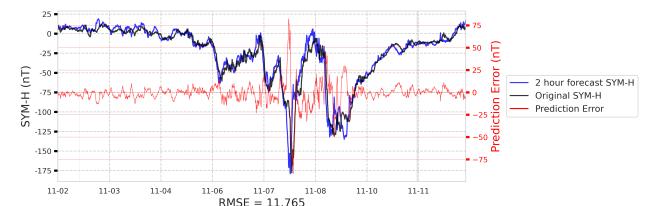
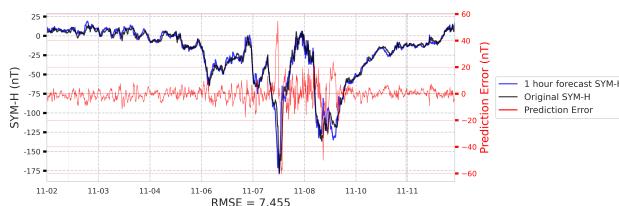
This file contains the figures for each of the test geomagnetic storms, comparing the observed and predicted SYM-H for the two trained neural networks for both time horizons, 1 and 2 hours ahead.

- 1 hour model: Evaluated with SWEPAM's missing data filled with SWICS for 1 hour ahead forecasts.
- 2 hours model: Evaluated with SWEPAM's missing data filled with SWICS for 2 hours ahead forecasts.
- 1 hour model in real-time: Evaluated in real-time conditions, SWEPAM's missing data will be interpolated if the value to interpolate to is available, otherwise the last valid value is propagated for 1 hour ahead forecasts.

- 2 hours model in real-time: Evaluated in real-time conditions, SWEPPAM's missing data will be interpolated if the value to interpolate to is available, otherwise the last valid value is propagated for 1 hour ahead forecasts.



**Table S1.** Predictions for Storm Number 26 – June of 1998

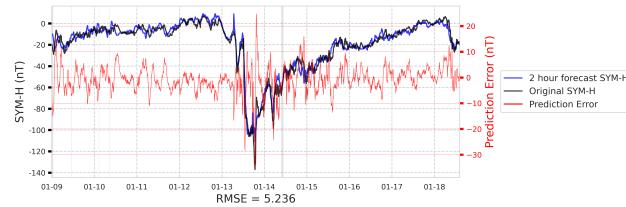


**Table S2.** Predictions for Storm Number 27 – November of 1998

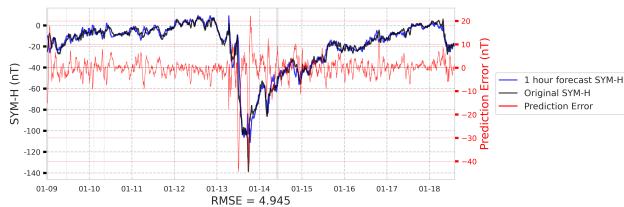
June 7, 2023, 7:39pm



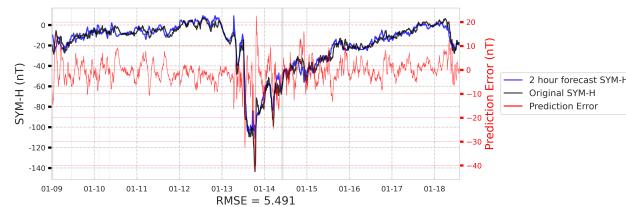
1h forecast using SWICS data



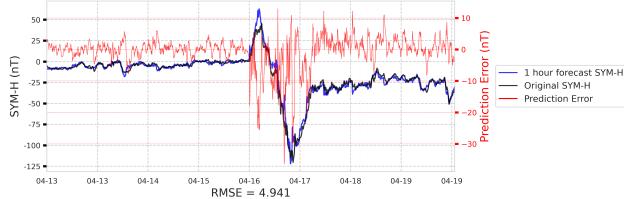
2h forecast using SWICS data



1h forecast real-time scenario



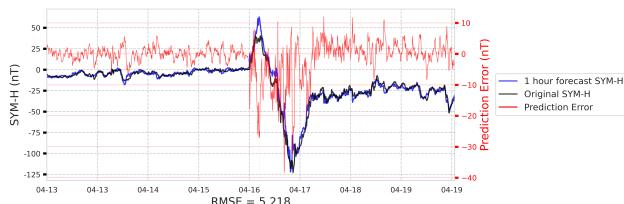
2h forecast real-time scenario

**Table S3.** Predictions for Storm Number 28 – January of 1999

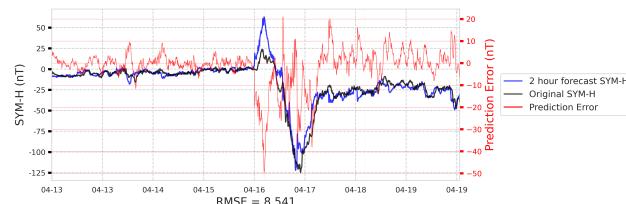
1h forecast using SWICS data



2h forecast using SWICS data



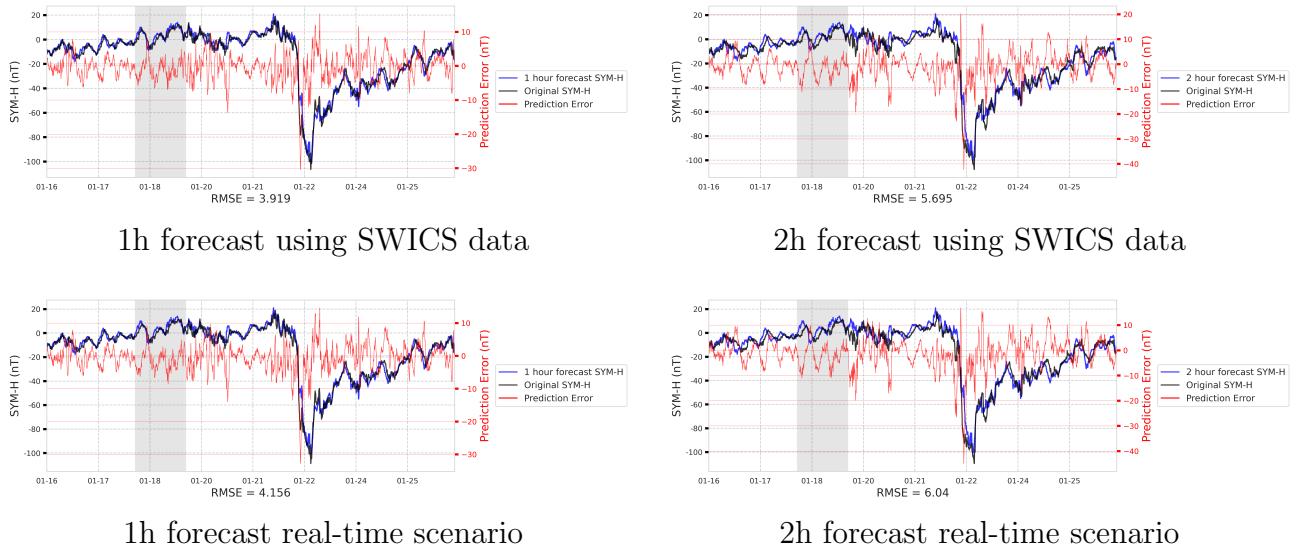
1h forecast real-time scenario



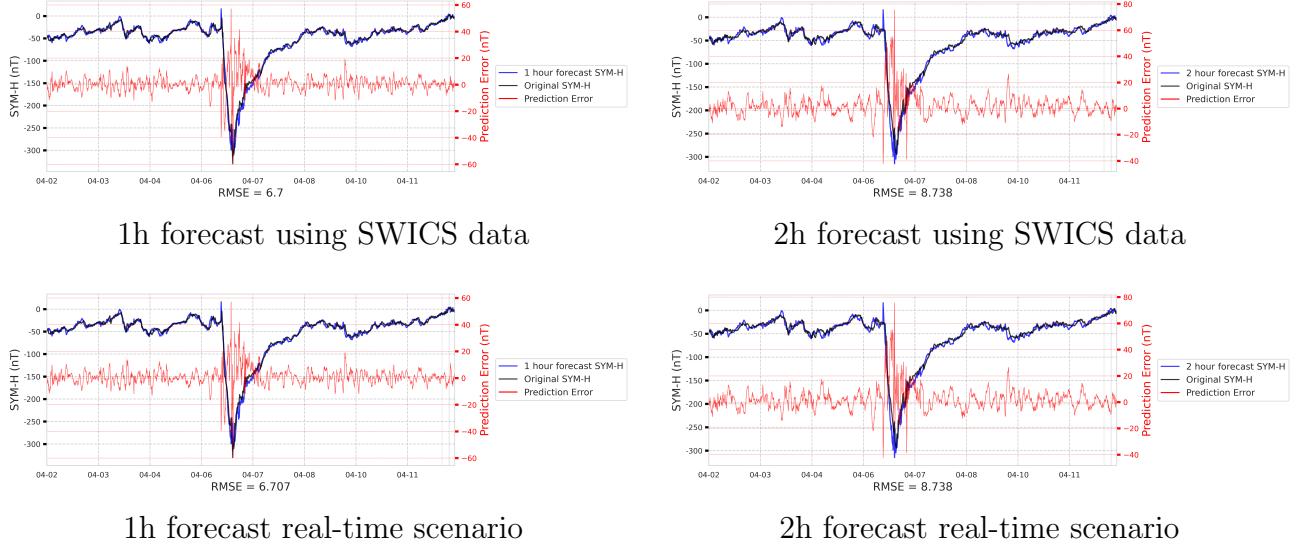
2h forecast real-time scenario

**Table S4.** Predictions for Storm Number 29 – April of 1999

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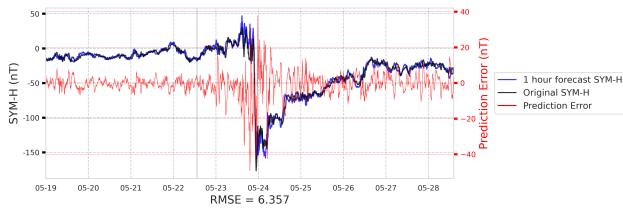


**Table S5.** Predictions for Storm Number 30 – January of 2000

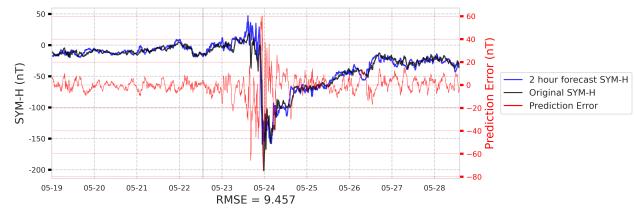


**Table S6.** Predictions for Storm Number 31 – April of 2000

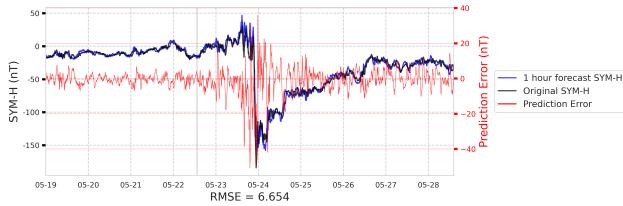
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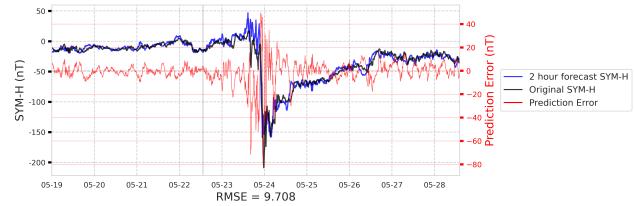
1h forecast using SWICS data



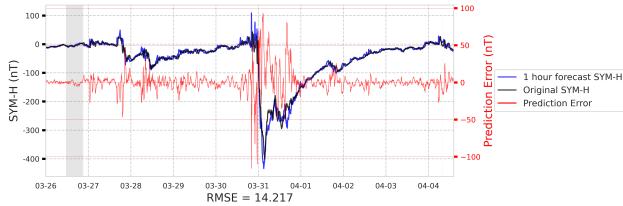
2h forecast using SWICS data



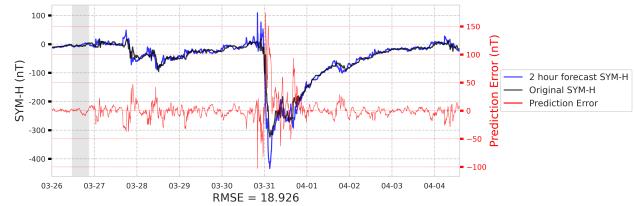
1h forecast real-time scenario



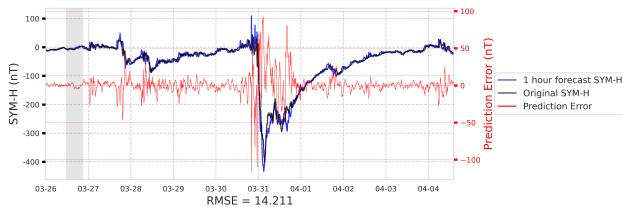
2h forecast real-time scenario

**Table S7.** Predictions for Storm Number 32 – May of 2000

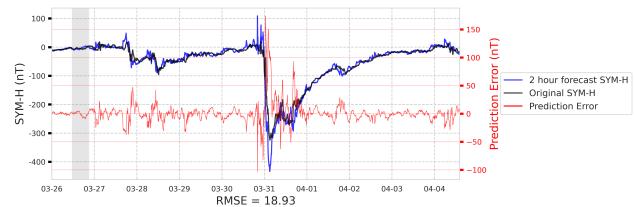
1h forecast using SWICS data



2h forecast using SWICS data



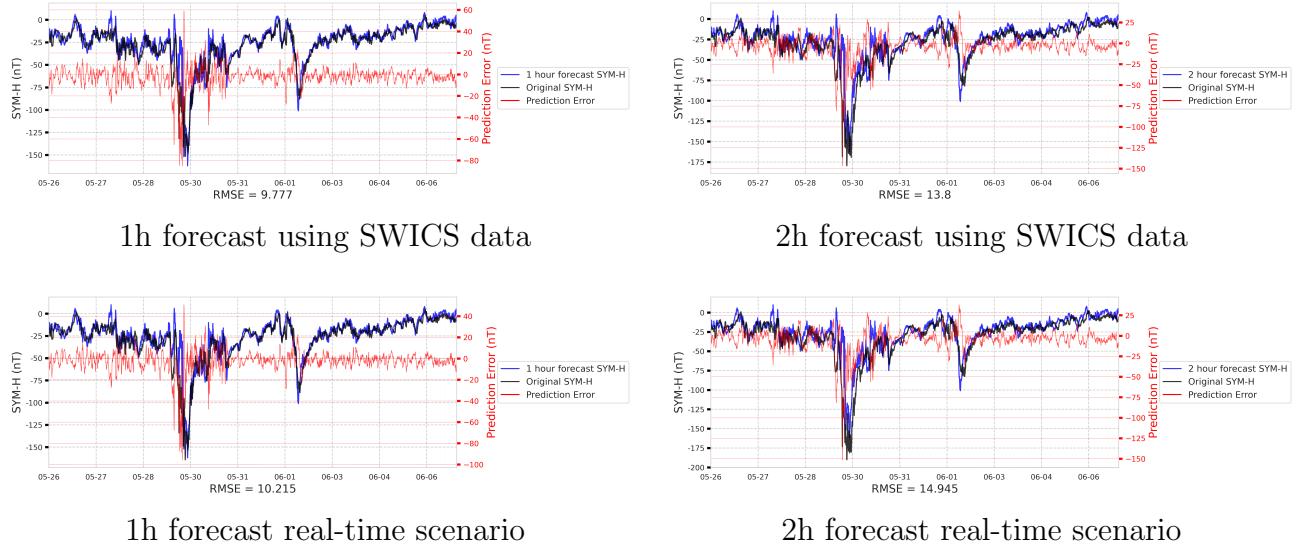
1h forecast real-time scenario



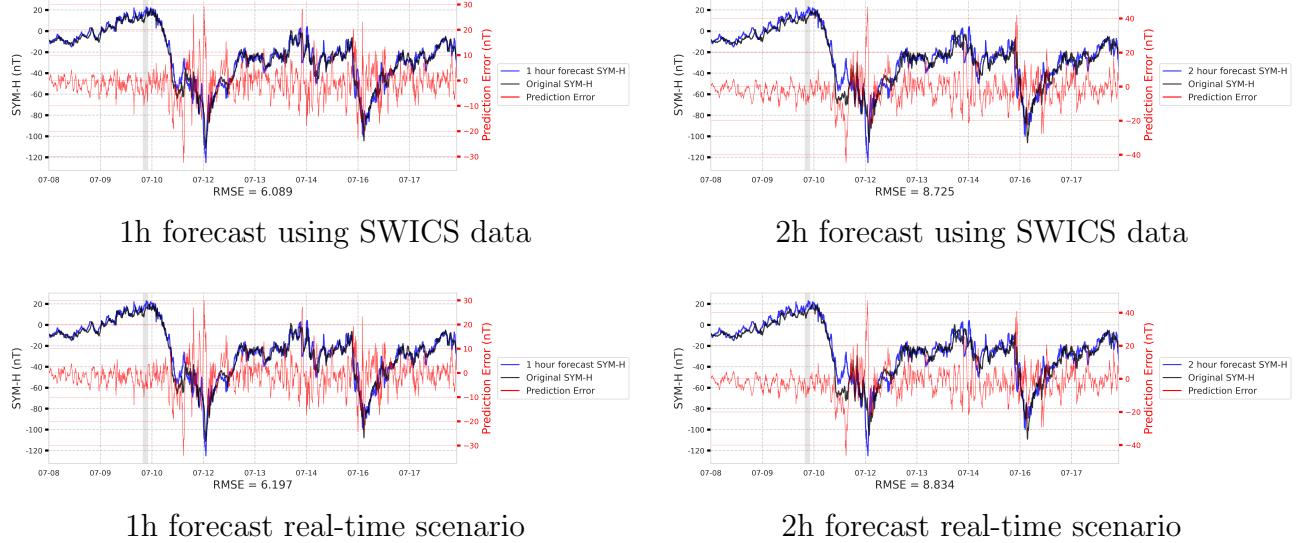
2h forecast real-time scenario

**Table S8.** Predictions for Storm Number 33 – March of 2001

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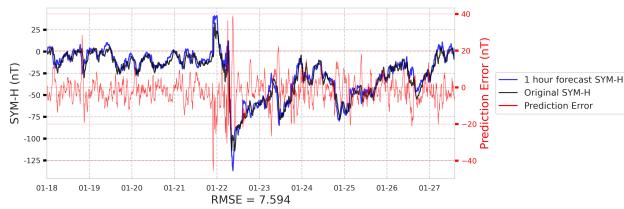


**Table S9.** Predictions for Storm Number 34 – June of 2003

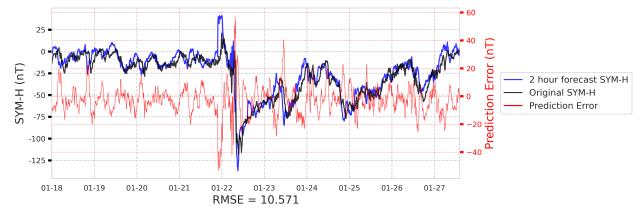


**Table S10.** Predictions for Storm Number 35 – July of 2003

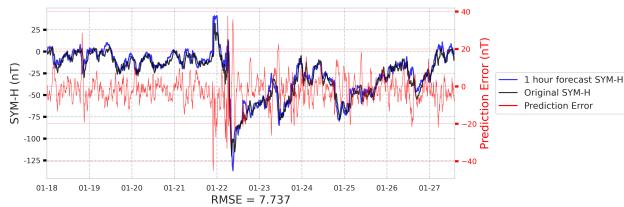
June 7, 2023, 7:39pm



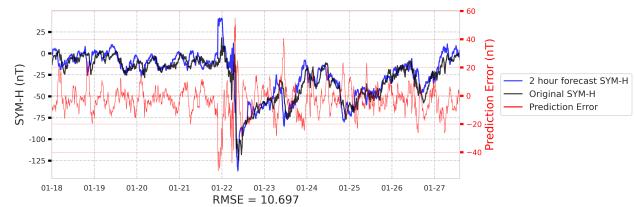
1h forecast using SWICS data



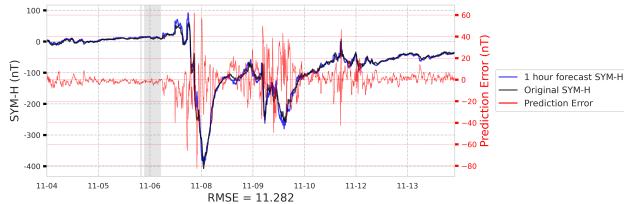
2h forecast using SWICS data



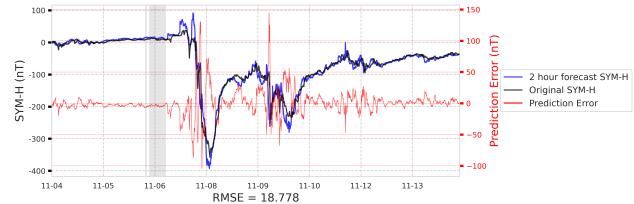
1h forecast real-time scenario



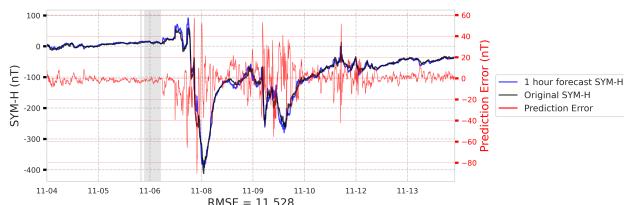
2h forecast real-time scenario

**Table S11.** Predictions for Storm Number 36 – January of 2004

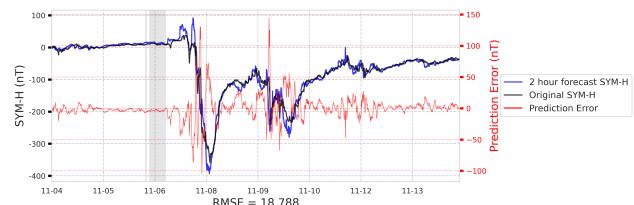
1h forecast using SWICS data



2h forecast using SWICS data



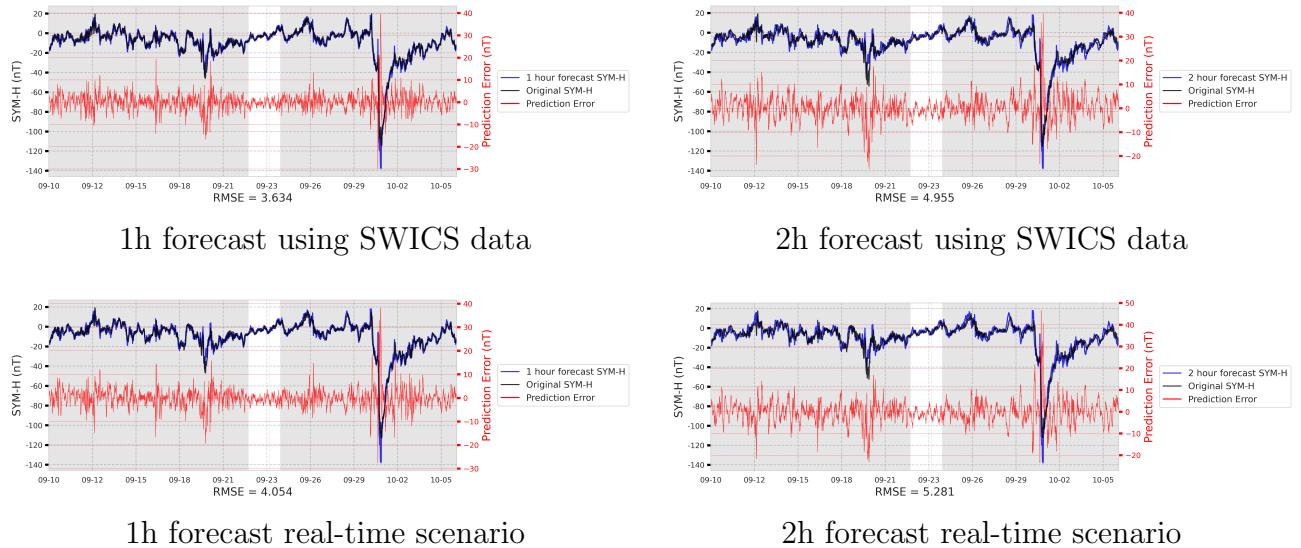
1h forecast real-time scenario



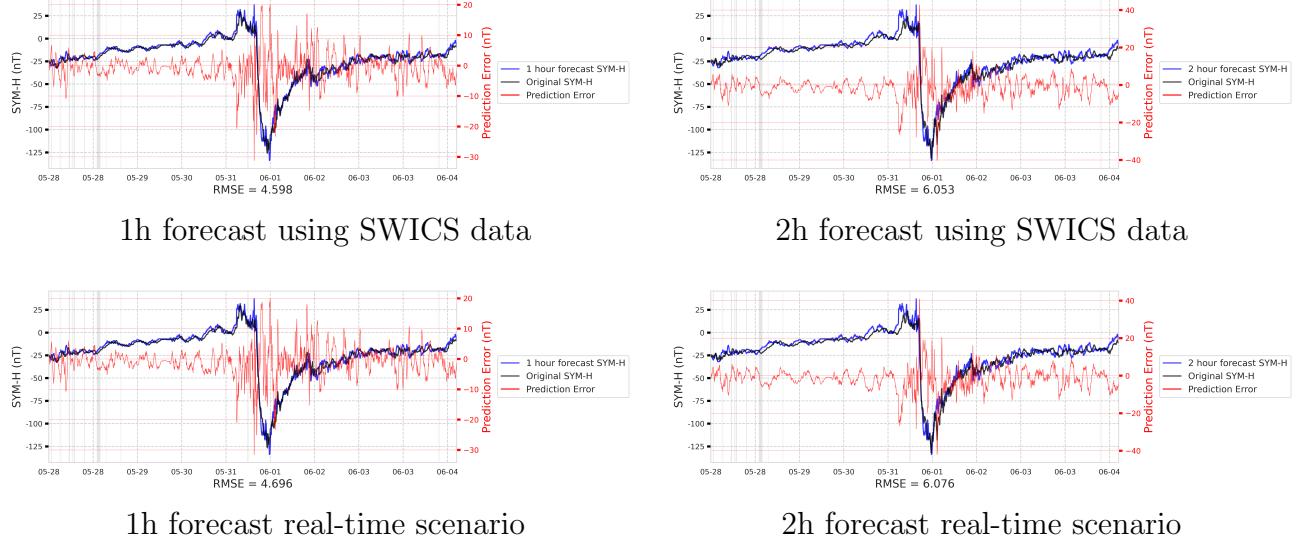
2h forecast real-time scenario

**Table S12.** Predictions for Storm Number 37 – November of 2004

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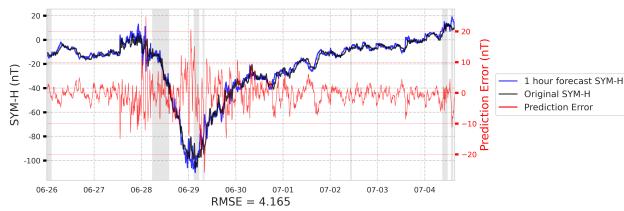


**Table S13.** Predictions for Storm Number 38 – September of 2012

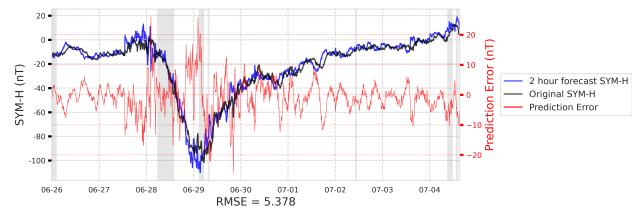


**Table S14.** Predictions for Storm Number 39 – June of 2013

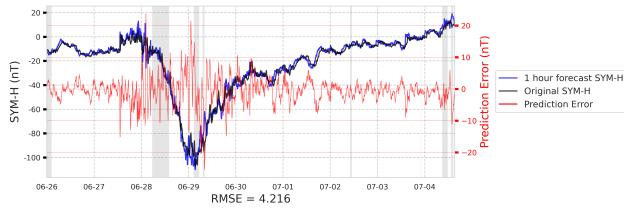
June 7, 2023, 7:39pm



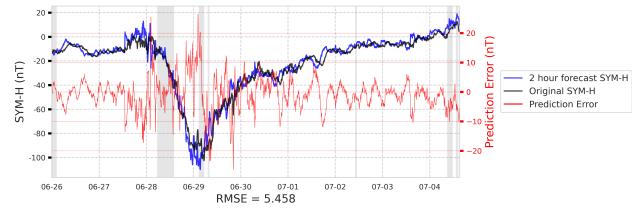
1h forecast using SWICS data



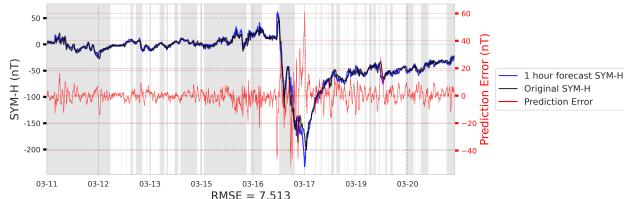
2h forecast using SWICS data



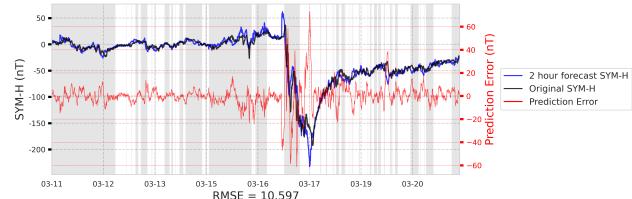
1h forecast real-time scenario



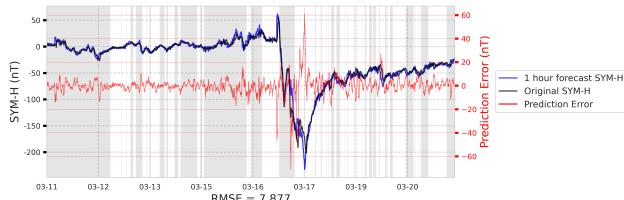
2h forecast real-time scenario

**Table S15.** Predictions for Storm Number 40 – June of 2013

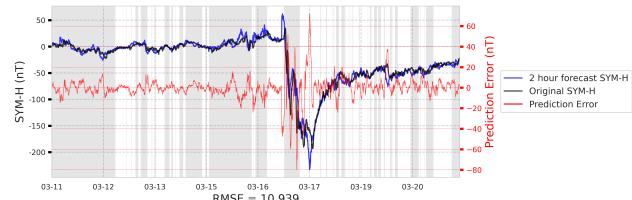
1h forecast using SWICS data



2h forecast using SWICS data



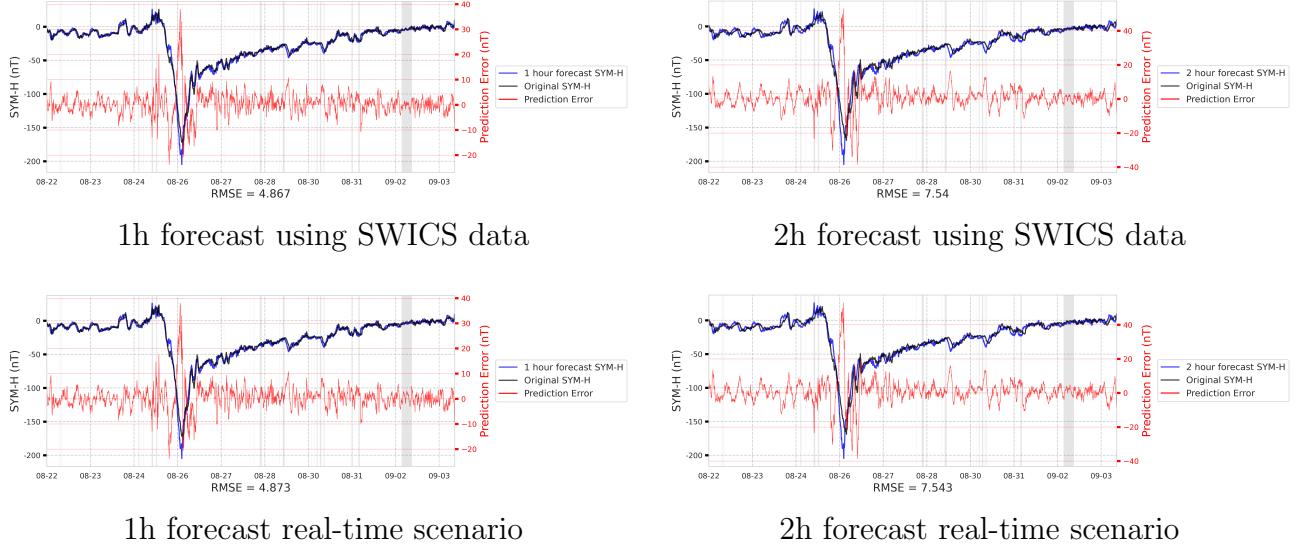
1h forecast real-time scenario



2h forecast real-time scenario

**Table S16.** Predictions for Storm Number 41 – March of 2015

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**Table S17.** Predictions for Storm Number 42 – August of 2018