Magnetic Field Modeling
Constrained by GOES and THEMIS
– the 16 February 2008 Substorm event –

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Model Description

\[ B = B^* + B_{SCW} \]

Where

- \( B^* \) is the modified T04 (T96, T01) model by changing the tail current intensity and the sheet thickness to:

\[
D(X,Y) \rightarrow D(X,Y) \left[ 1 - f \left( \frac{X - X_c}{\Delta X}, \frac{Y - Y_c}{\Delta Y} \right) \right]
\]

- \( B_{SCW} \) is the substorm current wedge model [Tsyganenko, 1997] which consists of a pair of spread-out current loops. The amplitude of the SCW is defined by:

\[
A = \begin{cases} 
0 & AL > AL_0 \\
 f(|AL| - |AL_0|) & AL < AL_0
\end{cases}
\]
Modification of Parameters

- Tail Current Thickness
- Tail Current Intensity
- Amplitude of the SCW

Time:
- $t_0$
- $t_1$
- $t_2$
- $t_3$

Phases:
- Growth phase
- Expansion phase
- Recovery phase