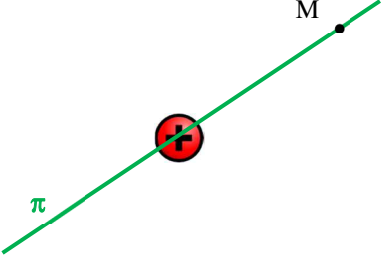
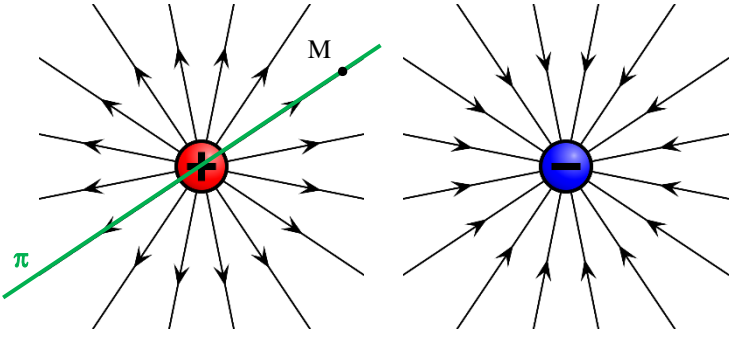
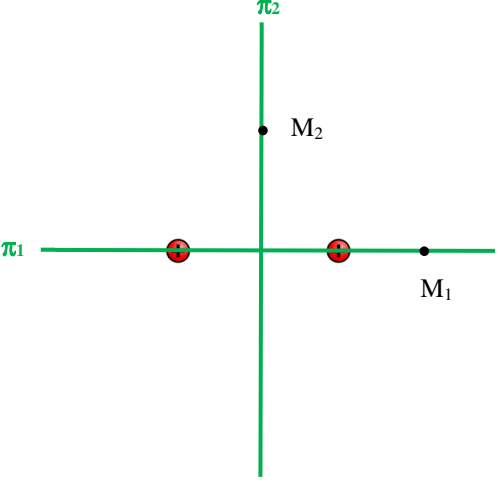
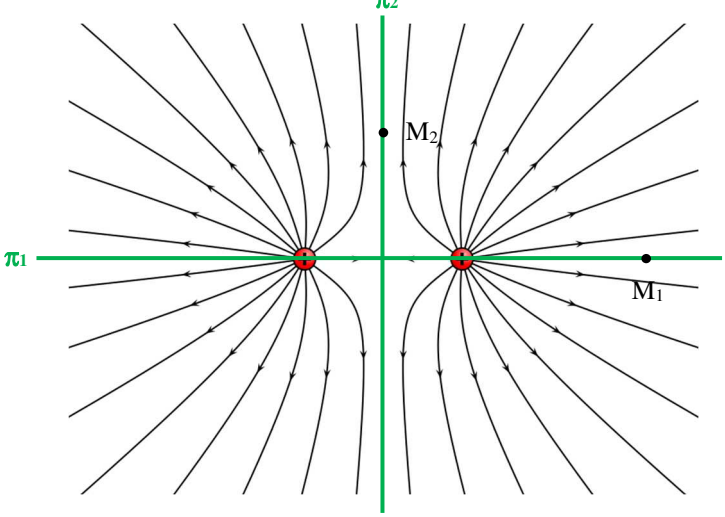
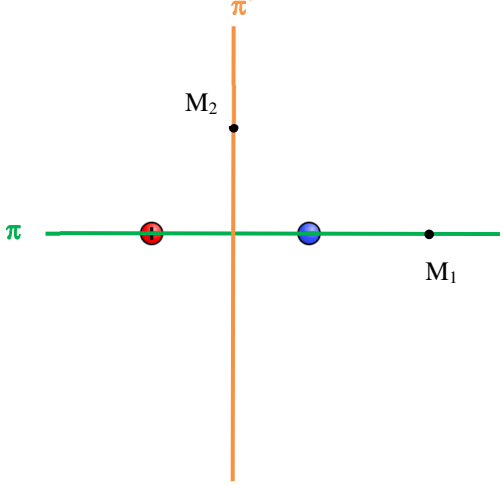
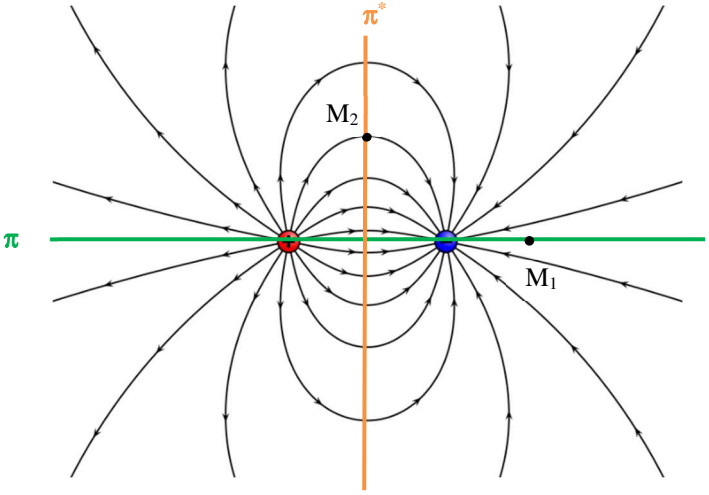


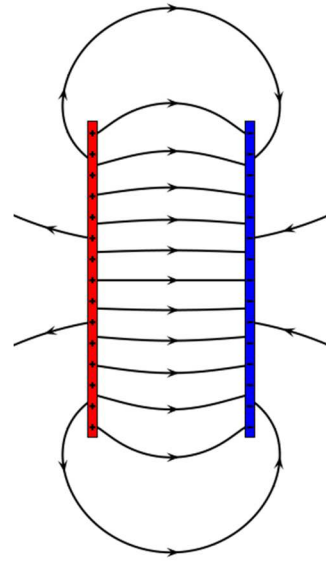
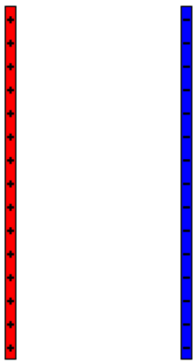
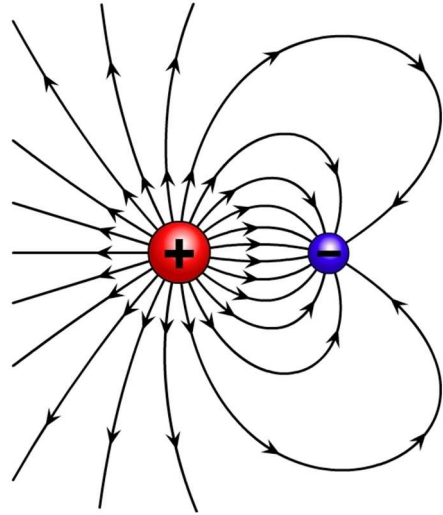
Symétries des sources – Symétries des champs

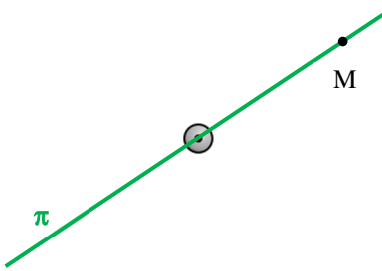
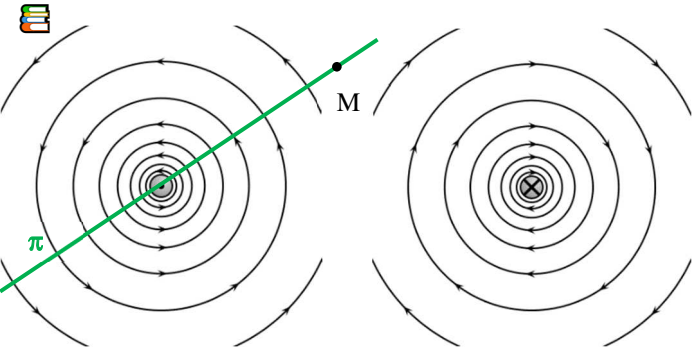
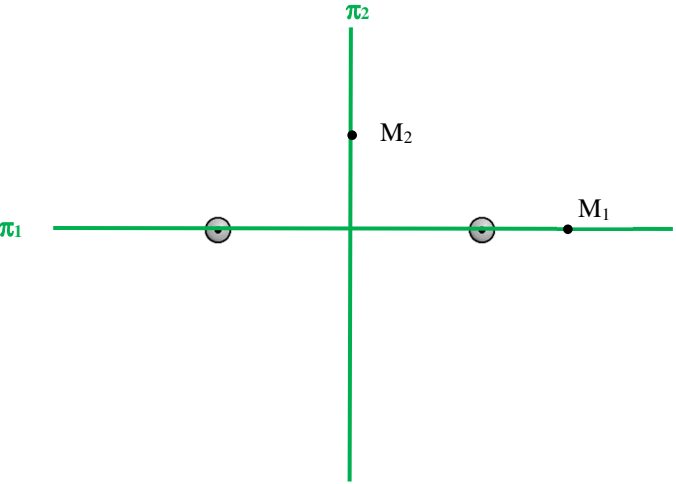
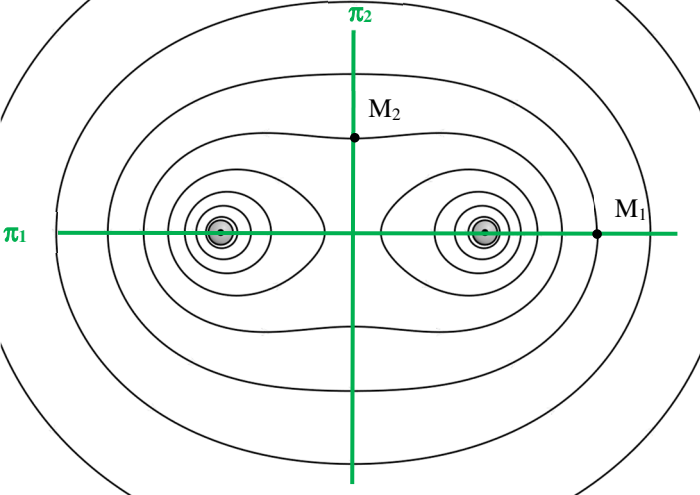
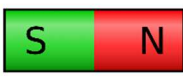
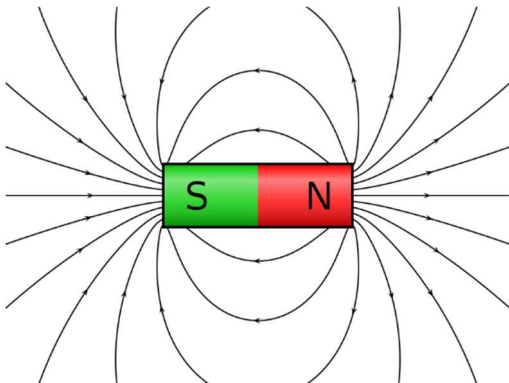
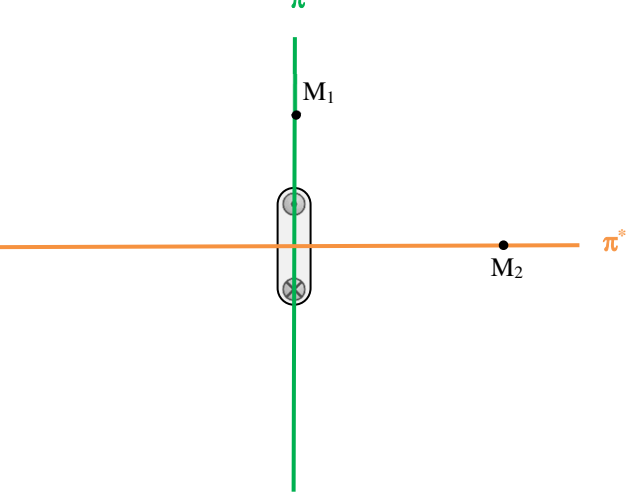
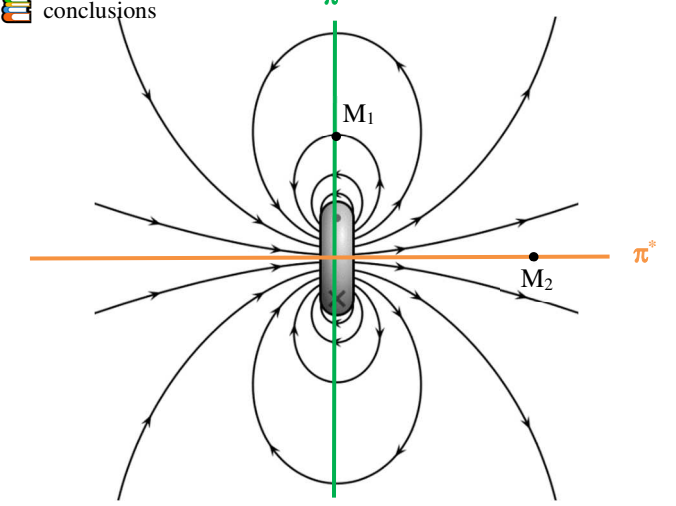
Objectif ✓ : déduire, à partir de cartes de champ (spectres), les propriétés de symétrie pour les champs $\vec{E}(M)$ et $\vec{E}(M')$ en deux points M et M' symétriques par rapport à un plan de symétrie π ($M' = \mathcal{S}_\pi(M)$) ou d'antisymétrie ($M' = \mathcal{S}_{\pi^*}(M)$).

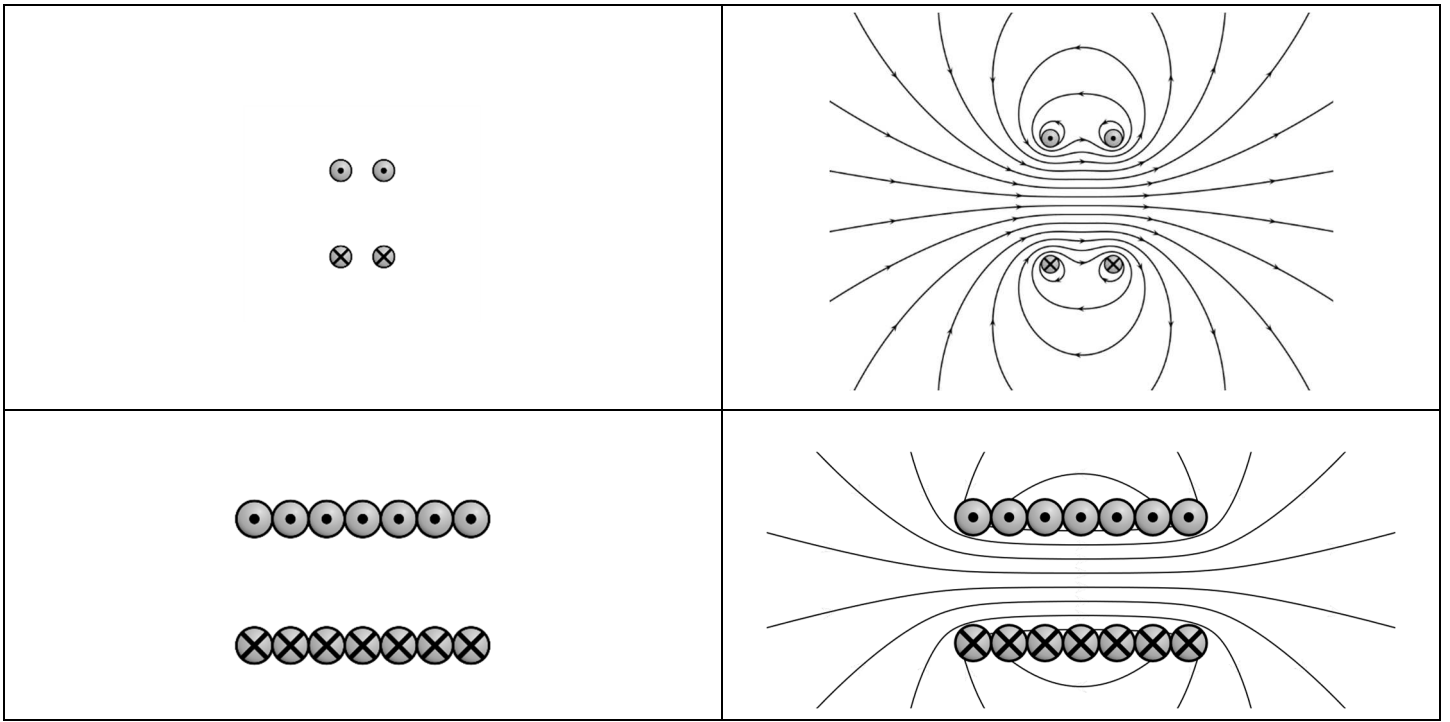
Savoir faire ✎ : déterminer les plans de symétrie / antisymétrie des sources (colonne de gauche) et en déduire la direction des champs. Vérifier en utilisant les spectres (colonne de droite).

💡 Champ électrostatique

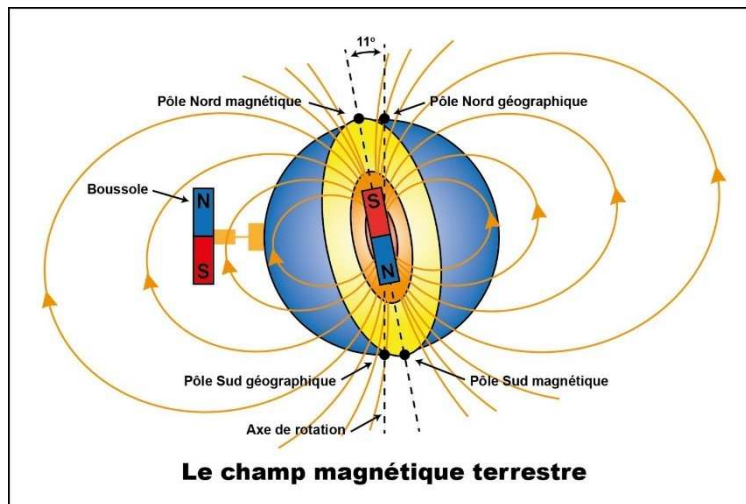
Sources = charges	Champ électrique
	
	
	<p>conclusions</p> 



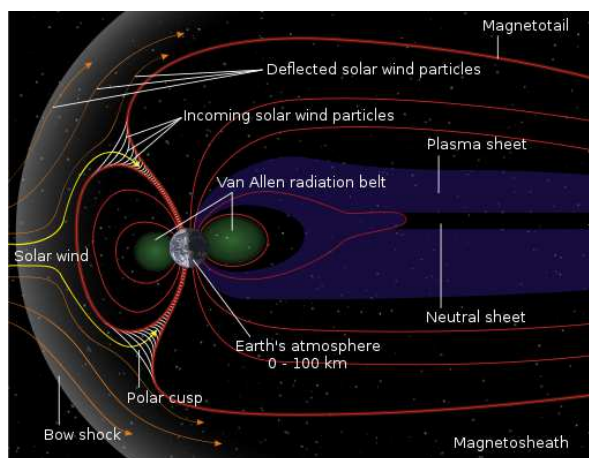
Sources = courants / aimants	Champ magnétique
	
	
	
	



Géomagnétisme



<https://gq.mines.gouv.qc.ca/geologie-pour-tous/geomagnetisme/>

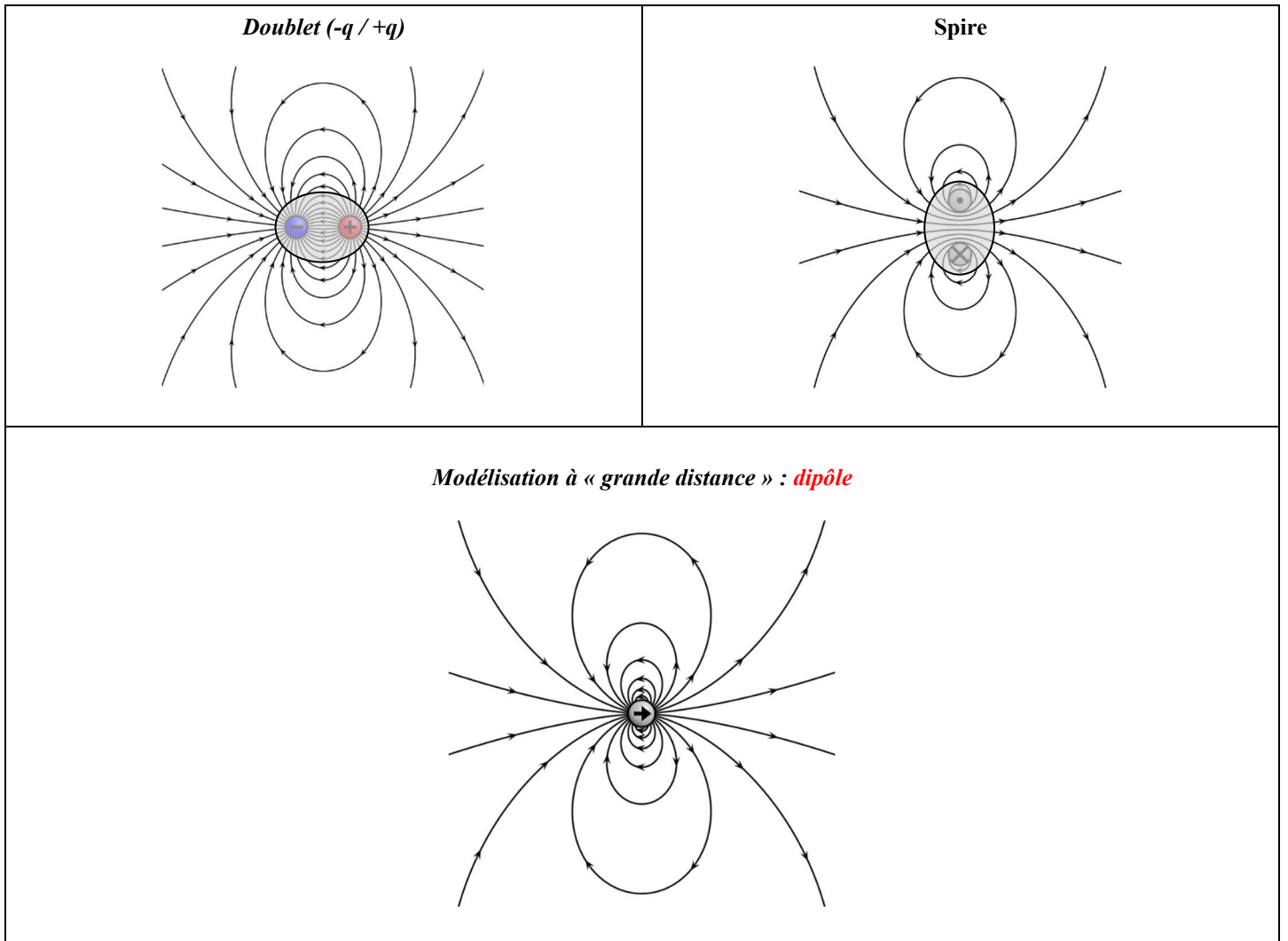


https://commons.wikimedia.org/wiki/File:Structure_of_the_magnetosphere_LanguageSwitch.svg

Ordres de grandeur

- ✓ **Champ terrestre** $B \approx 5 \cdot 10^{-5} \text{ T}$ (mesuré à la surface de la Terre)
- ✓ Aimant permanent $B \approx 0,1$ à 1 T (à quelques mm de sa surface)
- ✓ Electroaimant $B \approx 10$ à 100 T (à l'intérieur de l'électroaimant)

Comparaison des lignes de champ d'un doublet de charges (charges opposées) et d'une spire parcourue par un courant : loin des sources (approximation dipolaire) les lignes de champ semblent identiques : cf. chapitre dipôle.



Diagrammes créés à l'aide de VectorFieldPlot. Code source et documentation sur :

<https://commons.wikimedia.org/wiki/User:Geek3/VectorFieldPlot>