

The background of the image is a dark blue night sky filled with numerous small white stars of varying sizes. A prominent, larger white star is centered in the middle of the frame, positioned above a thin horizontal white line. This line extends from the left edge of the image to the right edge, passing through the central star. Below this line, the silhouette of dark, rugged mountains is visible against the starry sky.

JAN POTTHOFF

# STAR OR PULSAR

Project - Week 8

# OUTLINE

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Dataset

Theoretical Background

Modus Operandi and Challenges

Results

# **DATASET:**

## HTRU2 - Dataset

By University of  
Manchester

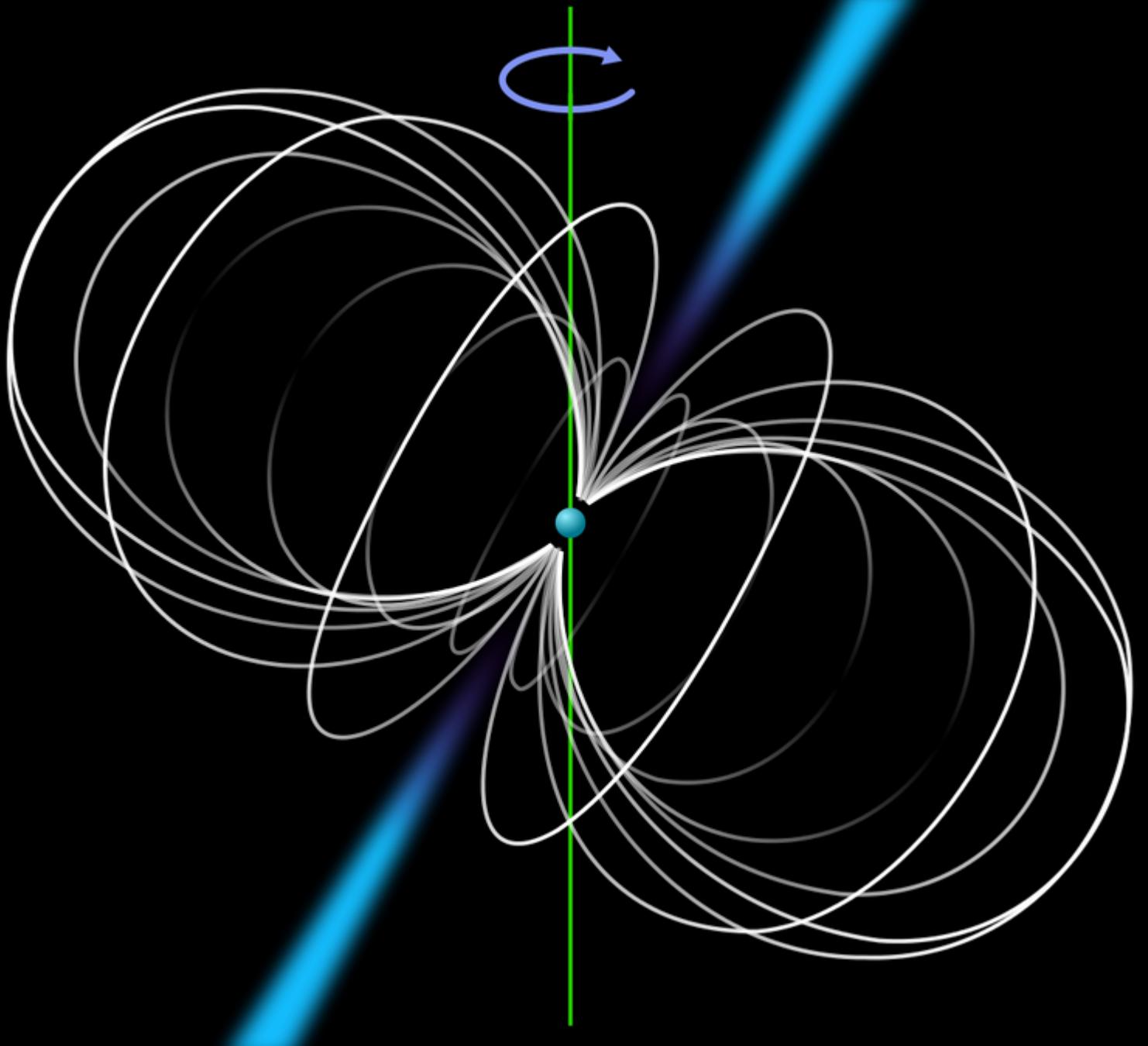
-  
Available on Kaggle

Most detections are caused by radio frequency interference (RFI) or noise  
-> legitimate signals hard to find.

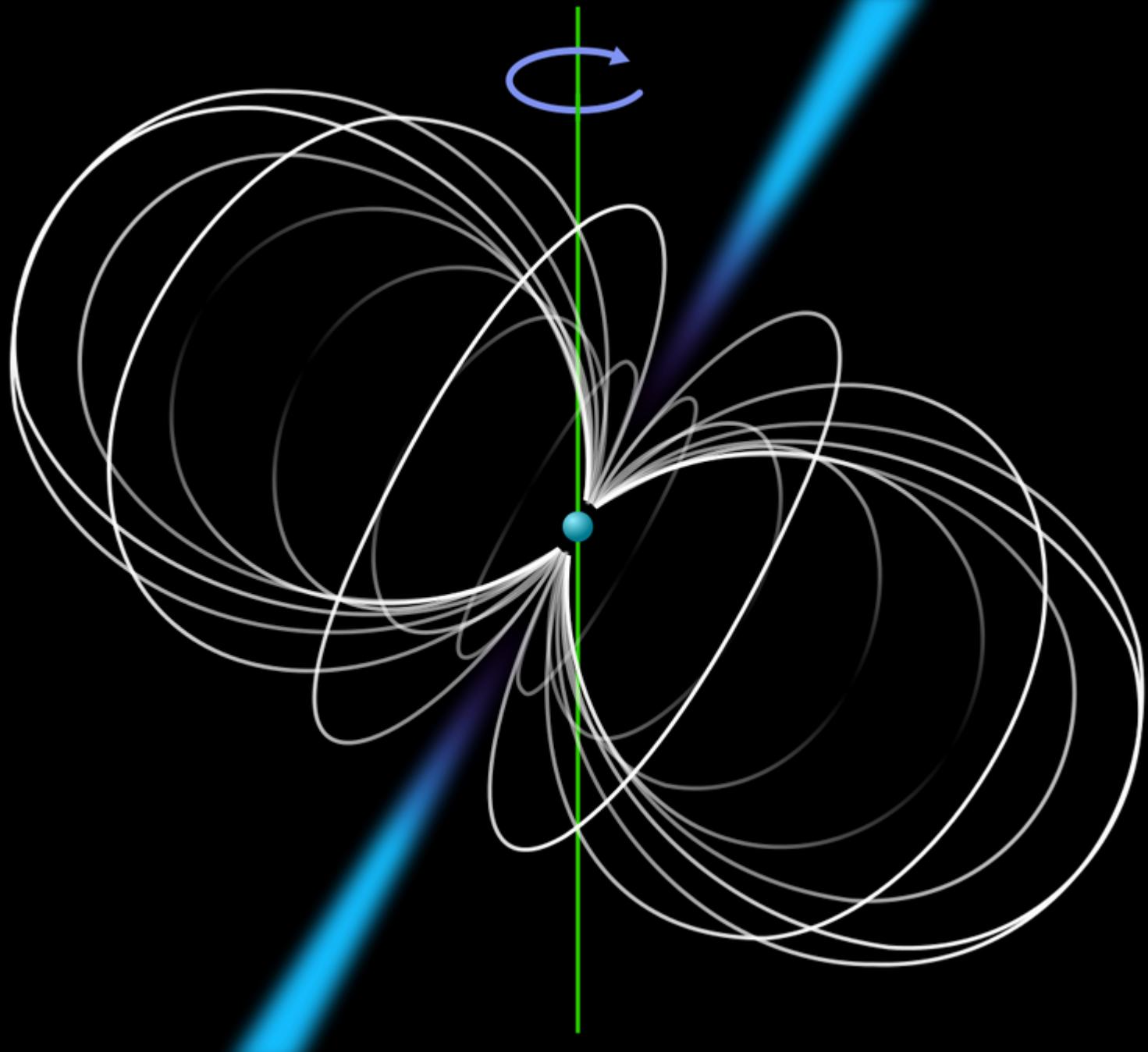
17,898 total examples.  
1,639 positive examples.  
16,259 negative examples.

# THEORETICAL BACKGROUND

# THEORETICAL BACKGROUND

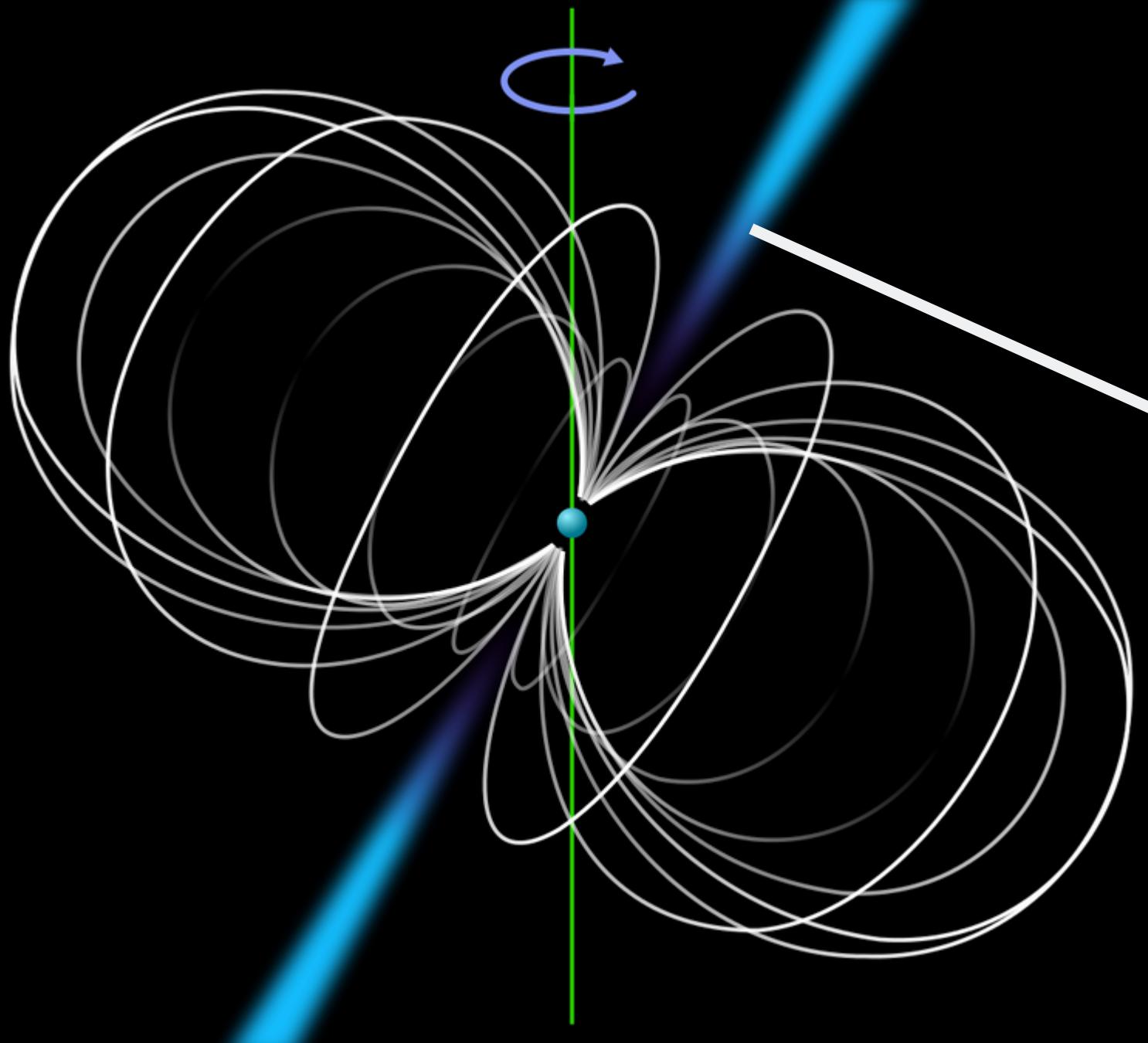


# THEORETICAL BACKGROUND



Neutron Star (or sometimes white dwarf) that spins with high angular velocity.

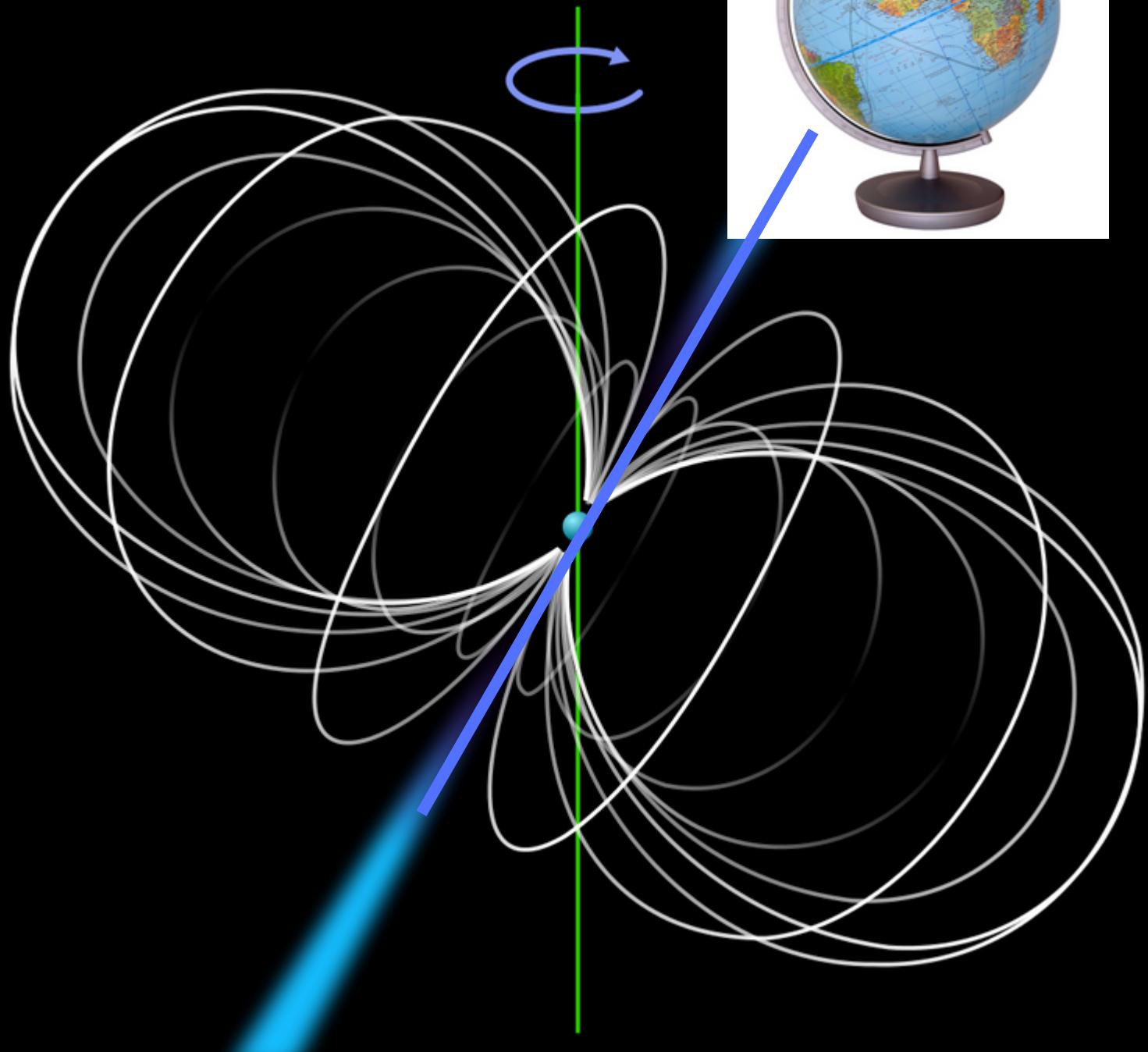
# THEORETICAL BACKGROUND



Neutron Star (or sometimes white dwarf) that spins with high angular velocity.

**This creates strong magnetic field.  
In return a jet of light is ejected along magnetic field lines.**

# THEORETICAL BACKGROUND

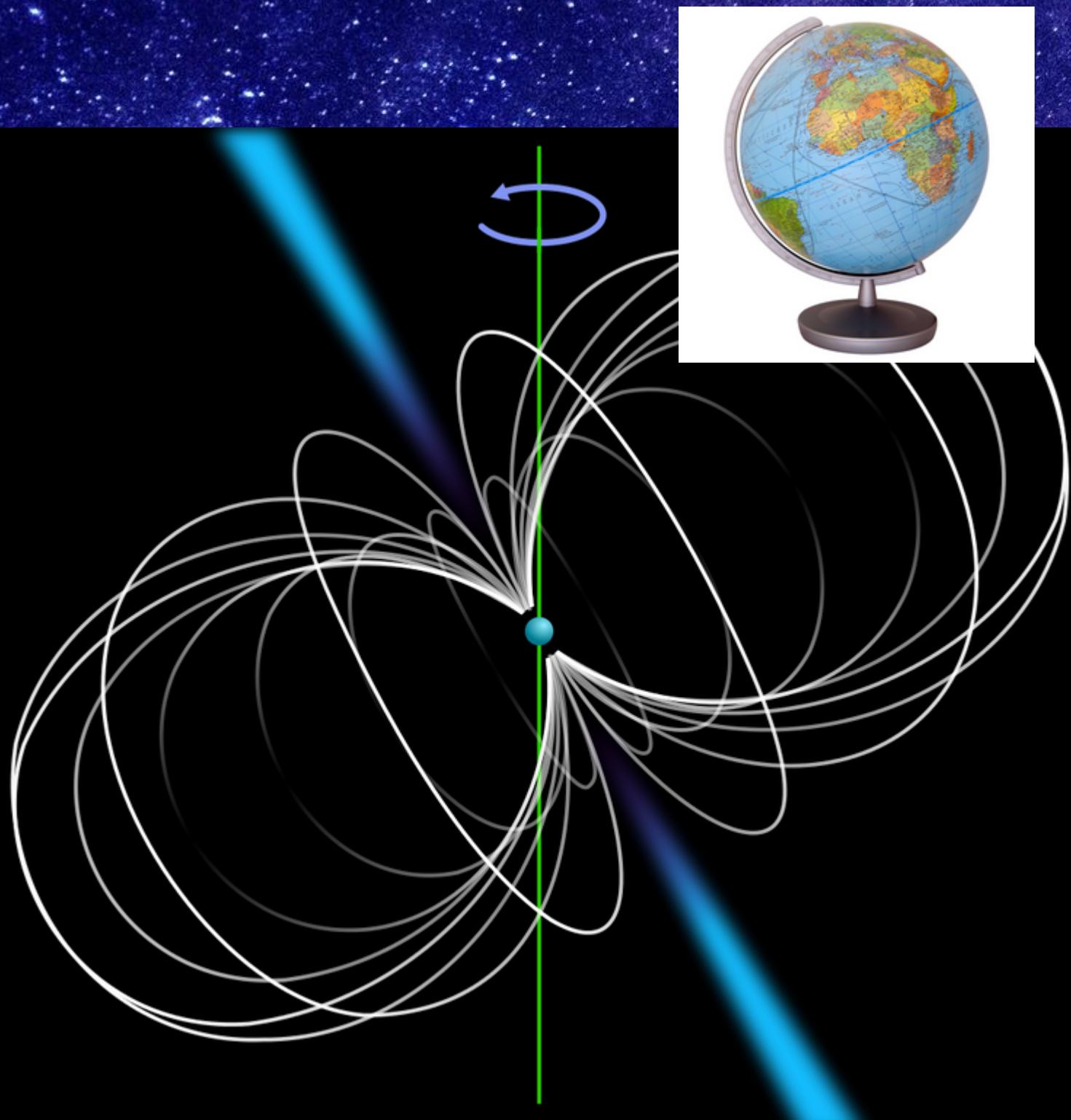


Neutron Star (or sometimes white dwarf) that spins with high angular velocity.

This creates strong magnetic field. In return a jet of light is ejected along magnetic field lines.

**It can only be seen when the light jet points directly towards earth**

# THEORETICAL BACKGROUND



Neutron Star (or sometimes white dwarf) that spins with high angular velocity.

This creates strong magnetic field. In return a jet of light is ejected along magnetic field lines.

**It can only be seen when the light jet goes directly towards earth**

# Checking Data

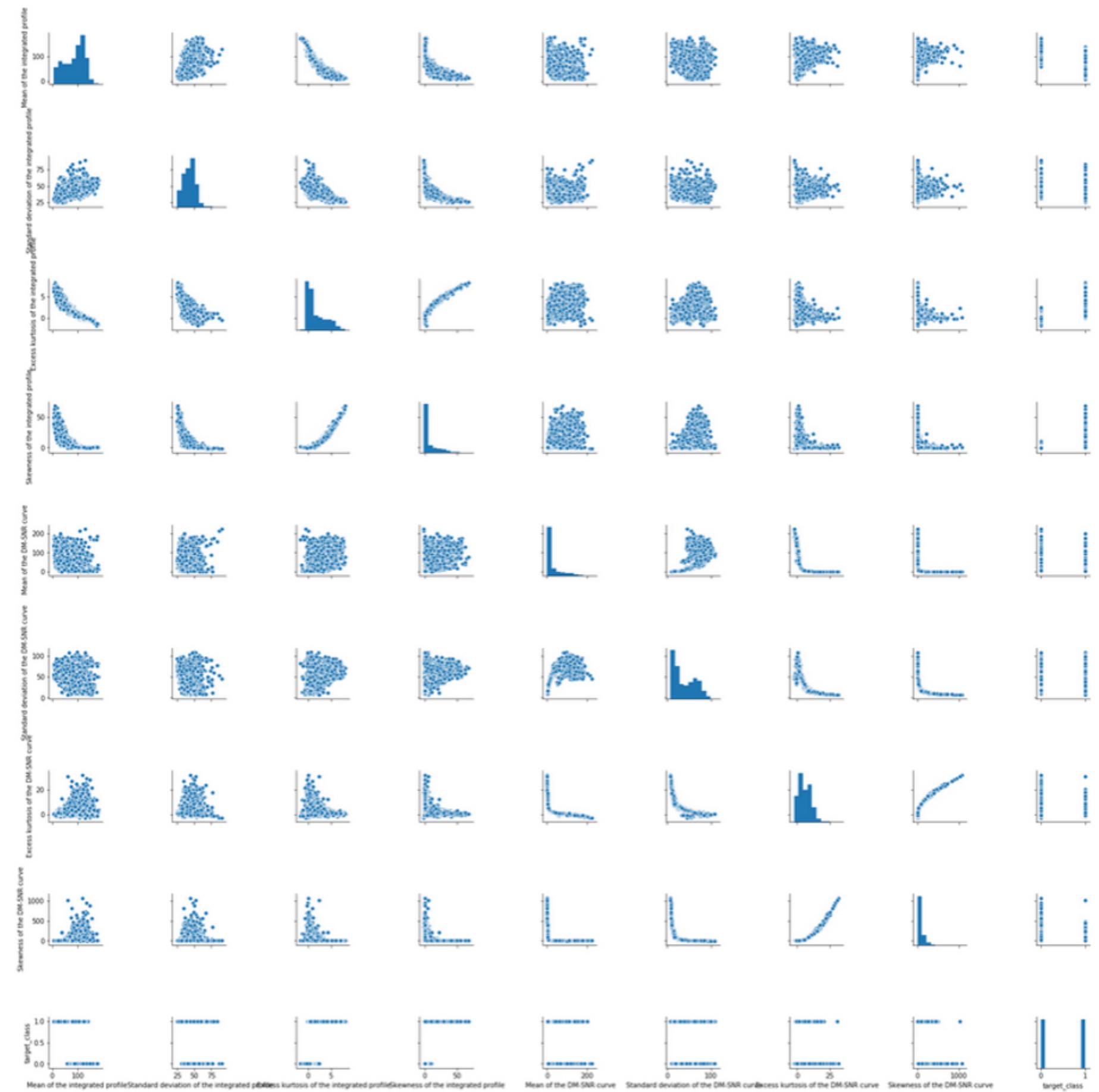
No NaN's

All numbers

Ready to go!

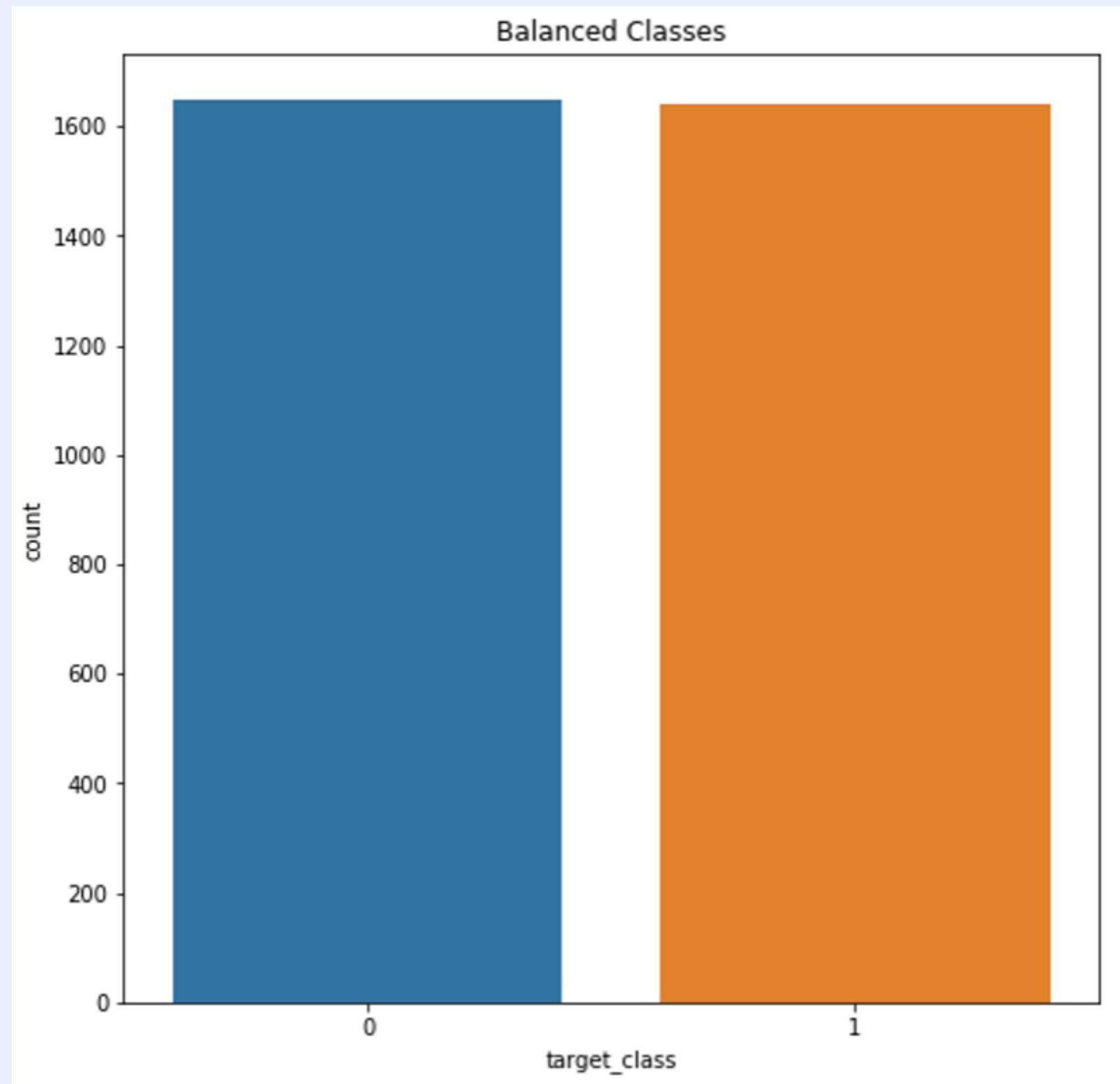
data.dtypes	
Mean of the integrated profile	float64
Standard deviation of the integrated profile	float64
Excess kurtosis of the integrated profile	float64
Skewness of the integrated profile	float64
Mean of the DM-SNR curve	float64
Standard deviation of the DM-SNR curve	float64
Excess kurtosis of the DM-SNR curve	float64
Skewness of the DM-SNR curve	float64
target_class	int64
dtype: object	

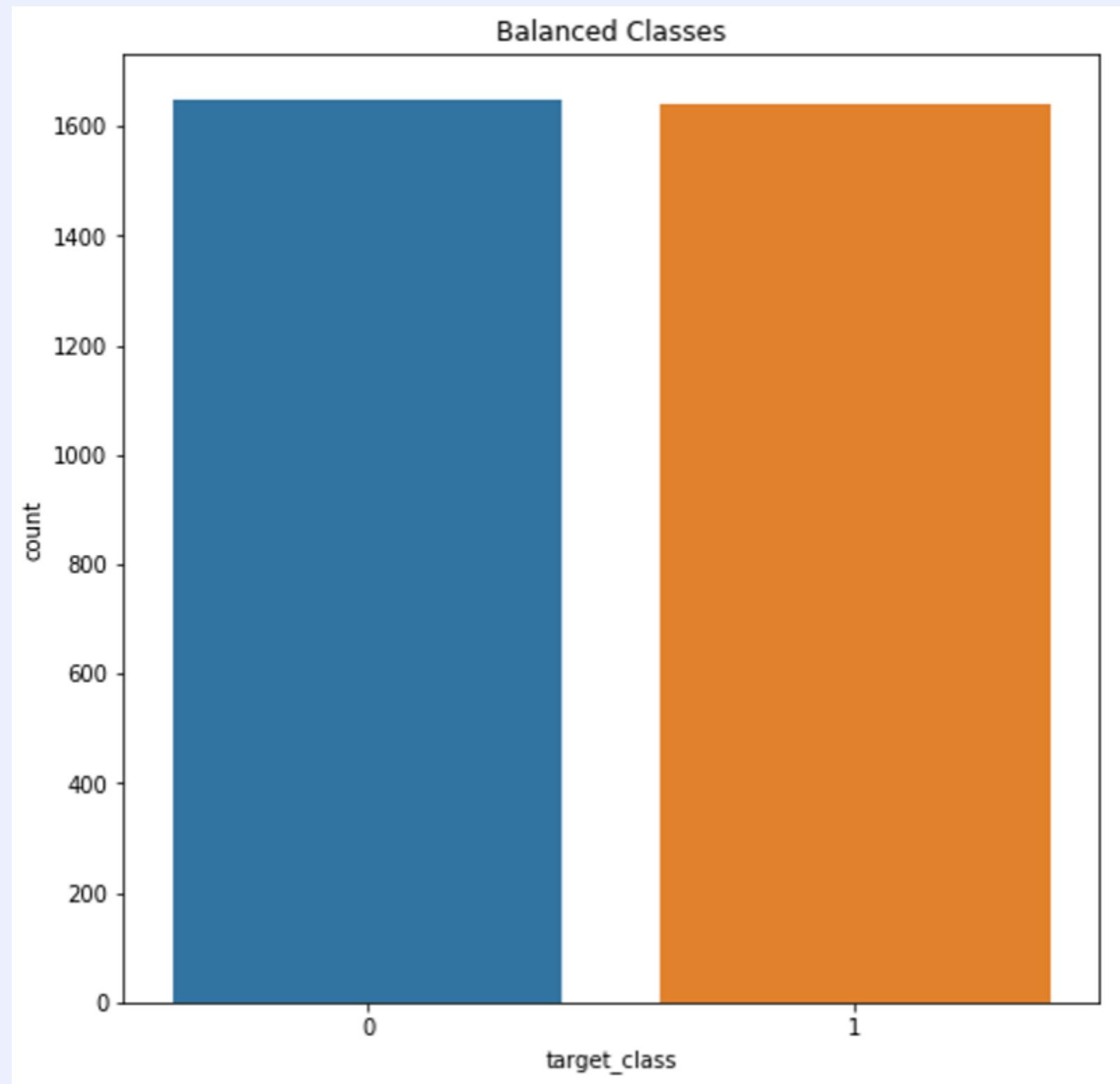
# QUICK GLANCE AT PAIRPLOT



```
data.target_class.value_counts()
```

0	16259
1	1639





Trying different models

Improving parameters

Final:  
91.5%

KNN - CLASSIFIER

ON BALANCED DATA

98.0%

LOGICAL REGRESSION

ON UNBALANCED

Trying different models

Improving parameters



Final:  
91.5%

KNN - CLASSIFIER

ON BALANCED DATA

98.0%

LOGICAL REGRESSION

ON UNBALANCED

Trying different models

Improving parameters

Original data and model was best  
all along