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THE EFFECTS OF TELLURIC LINES IN RADIAL VELOCITY SEARCHES FOR PLANETS WITH IODINE CELL AS CALIBRATORS[1]

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ABSTRACT

Tellurics are bad and you really don't want them. Here's how to get rid of them.

Subject headings: instrumentation

1. INTRODUCTION

We are going to cite Artigau et al. (2014); Cunha et al. (2014) and Rothman et al. (2013).

2. METHODOLOGY

Introduction to Keck/HIRES CPS data,

2.1. *Simulated Keck/HIRES Spectra*

ZZZ Plots:
- comparison between simulated and observed Keck/HIRES spectra: blaze, and zoom in.
- comparison between SME stellar template and empirical, deconvolved template.

2.2. *Injection of Telluric Lines*

Description of TERRASPEC.
ZZZ Plots:
- telluric line atlas in the optical? just to demonstrate where they are.
- simulated observation and template with injected tellurics, overplotted with clean simulated spectra, which would also demonstrate that due to BC, lines will pull on each other.

2.3. *Extraction of Radial Velocities*

Introduction to Doppler code and relevant adoption part for the simulation.

How the end product RVs are computed (vanking, or other weighting schemes).

3. RESULTS

3.1. *Effects of Telluric Lines on RV Precision*

ZZZ Plots:
- telluric free simulations to demonstrate RV precision, vs. year, vs. BC
- telluric injected simulations to demonstrate effects, vs. year, vs. BC
- RV vs. BC for chunks with and without telluric lines before and after injection

3.2. *Remedies and Their Effectiveness*

ZZZ Plots:
- demonstration of effectiveness and ineffectiveness of double masking.
- demonstration of effectiveness of a clean template and forward modeling tellurics.
- demonstration of precision required for modeling tellurics, and maximum tolerance for template 'cleaness'.

4. SUMMARY AND FUTURE WORK

Work on actual observations!

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