An efficient kinetic modeling in plasmas by using the AWBS transport equation

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Abstract

The AWBS Boltzmann transport equation for electrons equipped with a simplified e-e collision operator [?] provides an efficient, yet physically relevant, kinetic extension compared the classical Spitzer-Harm heat flux (SH) based on local approximation and flux-limiting. This classical approach is widely used in plasma kinetics models coupled to hydrodynamics. Even though SH reflects the electron-electron collision effect, the essential physical properties of the electron transport cannot be modeled with an explicitly local model. A simple form of the AWBS model opens a way to couple kinetics to hydrodynamic codes while describing the important physics correctly. Since the electron-electron collision effect becomes especially important in the case of low ion potential, we focus on presenting results related to low Z plasmas.

Keywords: kinetics; hydrodynamics; nonlocal electron transport; laser-heated plasmas.

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Contents

1. Introduction

2. The AWBS nonlocal transport model

[1]

3. BGK, AWBS, and Fokker-Planck models in diffusive regime

3.1. The BGK diffusive electron transport

3.2. The AWBS diffusive electron transport

3.3. The Fokker-Planck diffusive electron transport

[2], [3], [4]

4. Benchmarking the AWBS nonlocal transport model

4.1. Review of simulation codes

4.1.1. C7

4.1.2. ALADIN

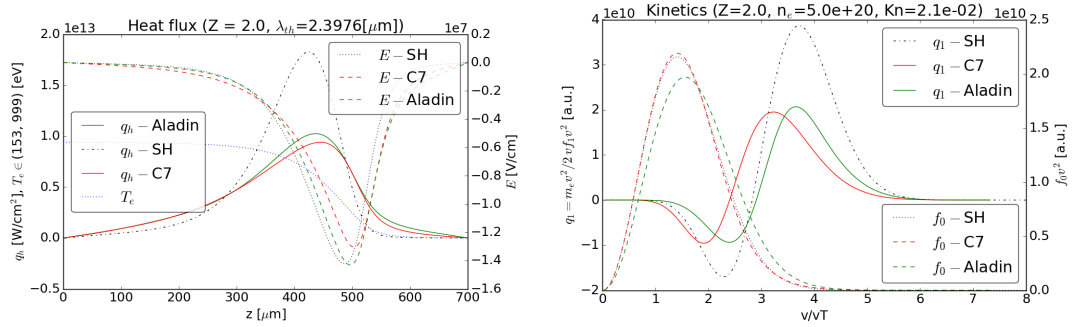*4.1.3. IMPACT*

4.1.4. CALDER

4.2. Simulation results

Figure 1: Left: correct steady solution. Right: time and point to be precised by Aladin.
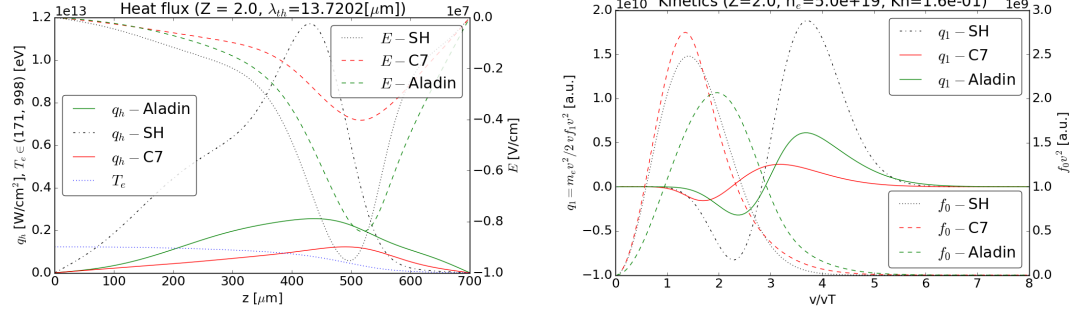
Figure 2: Left: Does not look as steady solution. Right: time and point to be precised by Aladin.
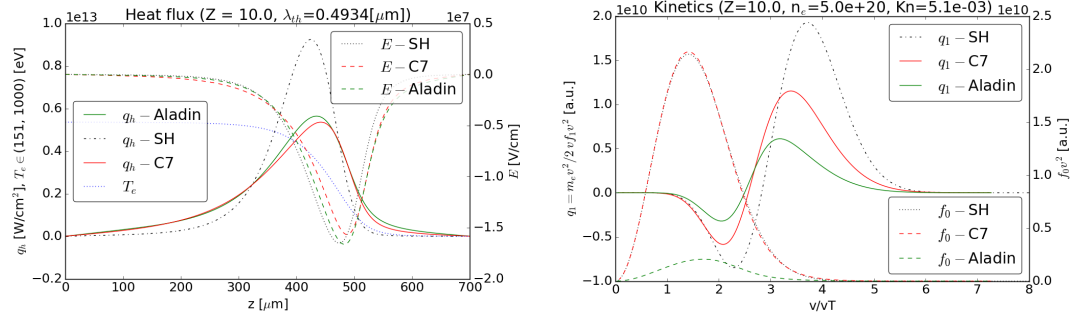

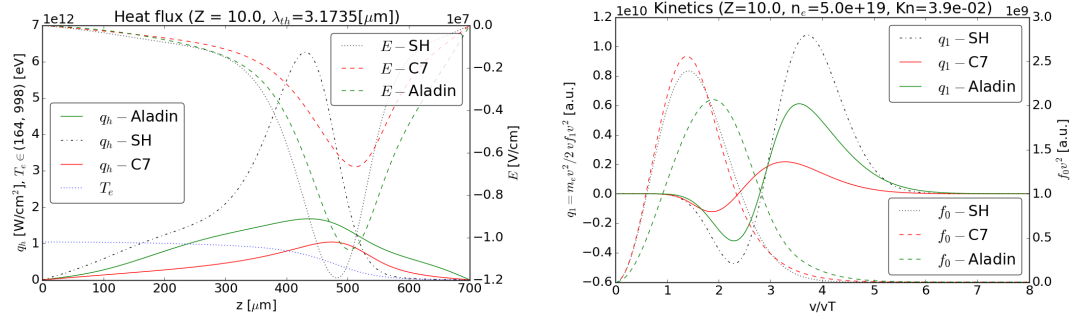Figure 3: Left: correct steady solution. Right: time and point to be precised by Aladin.

Figure 4: Left: Does not look as steady solution. Right: time and point to be precised by Aladin.

4

5. Conclusions

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