

# F. J. Duarte, *Tunable Laser Optics* (Elsevier Academic, New York, 2003)

## Corrigenda

### Introduction

In the process of teaching a course on laser optics, using *Tunable Laser Optics* as text, a number of misprints and errors have come to my attention. These are listed here. The author gratefully acknowledges the help of Robert H. Nuttall in the composition of this list. This corrigenda will be updated as it becomes necessary.

F. J. Duarte

### **Preface**

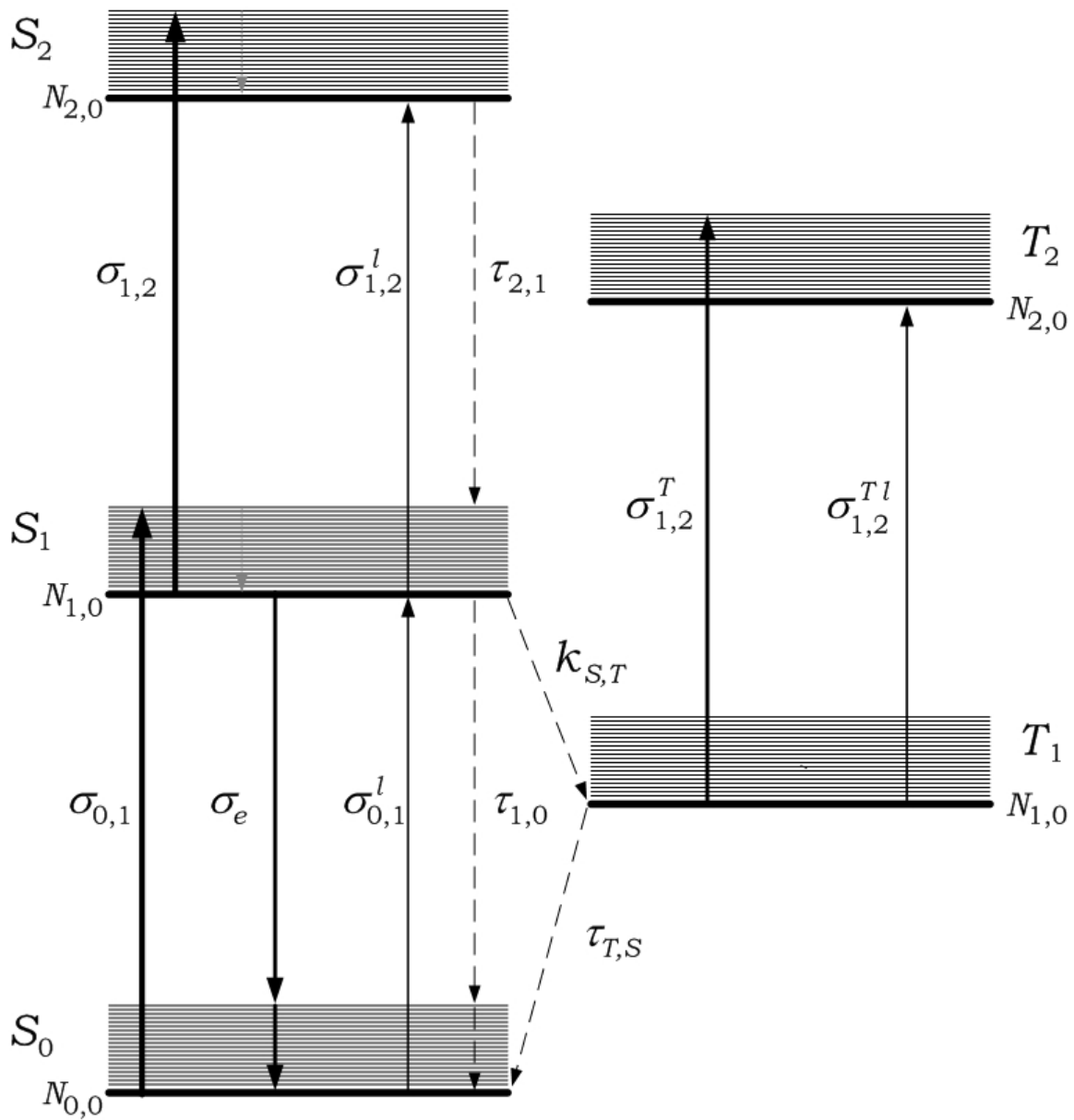
Last line: “word” should be written as *work*.

### **1.1 INTRODUCTION**

Page 2, line 1: “measurements on” should be written as *measurements of*.

### 1.3.2 Dynamics of the Multiple-Level System

Page 7: the upper vibrational-rotational levels of the various electronic states were not printed in Fig. 1.3. The complete figure is:



### 1.3.3 Transition Probabilities and Cross Sections

Page 14, line 1: “linewith” should be written as *linewidth*.

### 2.2.1 GEOMETRY OF THE N-SLIT INTERFEROMETER

Page 31, line 35: “comprising by” should be written as *comprised of*.

### 2.7 DIRAC AND THE LASER

Page 42, line 4: “whole the array” should be written as *whole array*.

### REFERENCES

Duarte, F. J., and Paine, D. J., (1989). Quantum mechanical description of N-slit interference phenomena, In *Proceedings of the International Conference on Lasers '88* (Sze, R. C., and Duarte, F. J., eds.). STS Press, McLean, VA, pp. 42-47.

### 3.2 APPLICATIONS OF THE UNCERTAINTY PRINCIPLE IN OPTICS

Page 51, line 20: “using, Eq. (3.5)” should be written as *using Eq. (3.5)*.

### 4.2 GENERALIZED MULTIPLE-PRISM DISPERSION

Page 58: Equation (4.5) should be written as

$$d\psi_{1,m} / dn = -d\psi_{2,m} / dn$$

### 4.4 MULTIPLE-PRISM DISPERSION AND PULSE COMPRESSION

Page 71: “Eqs. (2.54) and (2.55)” should be written as *Eqs. (4.54) and (4.55)*.

### 5.2 POLARIZATION AND REFLECTION

Page 78, line 2: “law or” should be written as *law of*.

Page 78: Equation (5.33) should be written as

$$T = 4n/(n+1)^2 \quad (5.33)$$

Page 79: the units of the horizontal axis of Fig. 5.2 should be: *degrees* (°).

### 5.3.2 Induced Polarization in a Double-Prism Beam Expander

Page 81, line 18: “ $\psi_{1,1} = \psi_{1,1}$ ” should be written as  $\psi_{1,1} = \psi_{1,2}$ .

Page 81, line 15: “identical” should be deleted.

### 5.3.4 Attenuation of the Intensity of Laser Beams Using Polarization

Page 81, line 23, the following sentence should be inserted: *For applications that require conservation of the incident polarization a second Glan-Thompson polarizer, deployed for total transmission of the incident beam, should be inserted following the rotating polarizer.*

## 6.2 ABCD PROPAGATION MATRICES

Page 93, line 7: “form” should read: *from*

### 6.2.7 Single-Return-Pass Beam Divergence

Page 107: in Eq. (6.34) the distances in the 2<sup>nd</sup>, 6<sup>th</sup>, and 10<sup>th</sup> matrices are  $L_3$ ,  $L_1$ , and  $L_1$ , respectively.

Following Eq. (6.34) the following should be inserted: *In order to calculate the ABCD terms relevant to  $\Delta\theta$  the calculation should be performed from the output coupler to the grating and from the grating back to the output coupler. Hence the matrix sequence becomes*

$$9 \cdot 10 \cdot 11 \cdot 12 \cdot 13 \cdot 14 \cdot 1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8$$

Note: in this matrix sequence the given number refers to the position of the matrices as given in Eq. (6.34).

### 6.2.8 Multiple-Return-Pass Beam Divergence

Page 109: in Eq. (6.46), the + sign between the first two parentheses should be deleted and the equations should read

$$B_R = A_R \Lambda + (\alpha A_{R-1} + \chi L_{R-1})(\beta + \delta(\Xi - L_2)) \\ + \delta L_{R-1}(\chi L_2 + \delta) + \delta A_{R-1}(\alpha L_2 + \beta) \quad (6.46)$$

Note in the book  $L_{R-1}$  is printed in cursive style.

Page 109: in Eq. (6.49), the + sign between the first two parentheses should be deleted and the equations should read

$$B_1 = A_1 \Lambda + (\alpha + \chi \Lambda)(\beta + \delta(\Xi - L_2)) + \delta \Lambda(\chi L_2 + \delta) + \delta(\alpha L_2 + \beta) \quad (6.49)$$

Page 110, line 18: “conFigure” should be written as *configure*.

Page 114:

### PROBLEMS

3: Replace Fig. 6.19 by *Fig. 7.12* [Hint: use the following matrix sequence in reverse 9·10·11·12·13·14·1·2·3·4·5·6·7·8]

### 7.3.1 Tunable Laser Oscillators Without Intracavity Beam Expansion

Page 125: the missing units of the horizontal axis of Fig. 7.10 are: *degrees* (°).

#### **7.4.4 Longitudinal Tuning Techniques**

Page 142: last paragraph of 7.4.4. should read

“For a change in cavity length of  $\sim 0.4 \mu\text{m}$ , these authors report a nearly linear change in wavelength of  $\sim 1 \text{ nm}$ . Substituting  $\Delta L \approx 0.4 \text{ mm}$  and  $\lambda_1 \approx 1547 \text{ nm}$  into Eq. (7.61) yields  $\lambda_2 \approx 1548 \text{ nm}$ , which agrees fairly well with their experimental observation.”

#### **7.6 DESIGN OF EFFICIENT NARROW-LINEWIDTH TUNABLE LASER OSCILLATORS**

Page 146, line 33: “required” should be written as *required*.

#### **PROBLEMS**

Page 152, line 14: “reflection” should be written as *reflectivity*.

#### **8.3 OPTICAL PHASE CONJUGATION**

Page 168, Eqs. (8.62) and (8.63): the outside plus sign (+) of the third term (in parenthesis) should be replaced by a minus sign (−) and the inner sign in the parenthesis should be replaced by a plus (+) sign.

#### **Appendix of Laser Dyes**

The word “lansing” should be replaced by *lasing*.

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