

Preface

This monograph deals with experimental aspects of the fiber fuse phenomenon. My research began 17 years after this phenomenon was discovered. At that time, it had begun to attract attention as a serious problem for the optical communication industry (see Fig. 1.2). Although my research results using an ultrahigh-speed camera provided us with new findings about this moving luminous object, I could not help feeling that more experimental facts were needed if we were to extract the underlying mechanism explaining this seemingly strange behavior. Since then, I have collected many photographs showing fiber fuse damage, and this collection has convinced me that the behavior is no longer strange.

This monograph starts with a chapter reviewing silica glass optical fibers and the fiber fuse phenomenon and continues with three subsequent chapters exploring the fiber fuse behavior in typical single mode fibers step-by-step. To assist the reader, 12 links to online video clips are provided in the text (see Box 0.1 in the next section as an example). The last chapter concludes the discussion from a practical point of view to encourage further research.

I hope you enjoy the process of solving this riddle and discover the beauty of the track left by a tiny comet running through a silica glass fiber.

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Fiber Fuse

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Optical Fiber

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