**1. Purpose of the Study**

The purpose of this study is to utilize advanced digital tools for material reconstruction of fragmentary scriptural scrolls from Qumran, as a means to classify them according to the textual traditions of the biblical text. The method proposed in the study will be demonstrated by means of the reconstruction of 4QpaleoGen-Exl. This scroll contains 64 fragments, and it attests passages from Genesis 5:26 to Exodus 36:36. 4QpaleoGen-Exl is written in Paleo-Hebrew script, and it is dated between 100 B.C.E. and 25 B.C.E.[[1]](#footnote-1) The proposed reconstruction presents a model which locates some of the scroll’s fragments on a computerized canvas simulating its condition prior to its disintegration. Following the reconstruction, the study will analyze and map out the conclusions that can be drawn from it with respect to the nature of the scroll, its classification in one of the three known textual traditions of the Pentateuch (those of the Masoretic text, the Samaritan Pentateuch, and the Septuagint), and issues related to the transmission history of the Pentateuch.

The study integrates research into the material culture of the Qumran findings with the digital humanities – two leading disciplines within the broader contemporary humanities landscape. In addition to contributing to existing trends, the study also offers an innovative integration that is yet to receive sufficient attention. The study employs digital methodologies that were developed as part of the Scripta Qumranica Electronica (SQE) project, a German-Israeli collaboration in which I currently participate as a postdoctoral fellow. In this study, I propose to make use of the digital methodologies we developed for the SQE project, previously applied to post-biblical literature from the Second Temple period, for analyzing biblical scrolls from Qumran and as a methodological tool for researching the biblical text.

**2. Background and Literature Review**

**2.1 Textual History of the Pentateuch in Light of the Qumran Scrolls**

The discovery of the Qumran scrolls in the mid-twentieth century constitutes a turning point in the study of the biblical text. These scrolls are the earliest textual witnesses of the biblical text known to us today. They have enabled attempts to reconstruct the textual history of the Hebrew Bible as far back as the third century B.C.E.

Tov developed an influential model for textual analysis of the biblical manuscripts discovered in Qumran and the Judean Desert.[[2]](#footnote-2) According to Tov’s model, the three known textual traditions of the Pentateuch serve as criteria for classifying the scrolls textually. By means of statistical analysis of the number of instances of agreement between each manuscript and each of the textual traditions, Tov characterized the scrolls according to four categories: pre-Masoretic or partially Masoretic scrolls; pre-Samaritan scrolls; scrolls belonging to the branch of the textual tradition that served as the Hebrew basis for the Septuagint; and scrolls that cannot be classified textually. These latter cannot be classified for one of two reasons: either the narrow scope of the manuscript is insufficient to draw conclusions regarding the textual branch to which it belongs, or there is a lack of specific affinity to one of the categories (i.e., there is no tendency toward greater agreement between the version in the scroll and one of the textual traditions enumerated above).

On the basis of this model, Tov presented statistical data on the distribution of the biblical scrolls among the branches of the textual versions. He concluded that the pre-Masoretic tradition was among those that existed in the Qumran library, alongside the pre-Samaritan version, the version on which the Septuagint is based, and apparently some other versions as well. In fact, every biblical book had an unknown number of versions during the Second Temple period. Tov’s conclusion has been accepted by many scholars, and it calls into question the presumption, commonplace until the discovery of these scrolls, that the Masoretic version of the bible was the principal one in the ancient period.[[3]](#footnote-3)

The study of versions of the biblical text has been enormously enriched by research into the biblical scrolls in general, and by Tov’s classification model of the scrolls in particular. Nevertheless, Tov’s methodology does have limitations. It works well for scrolls in which it is possible to observe a clear tendency toward agreement between the manuscript and one of the textual traditions, as is the case with the pre-Masoretic scrolls and the pre-Samaritan scrolls. However, in the many instances in which there is no such tendency, it is not possible to classify a scroll textually. Moreover, there are some scrolls defined as semi-Masoretic. These scrolls show some degree of affinity with the Masoretic version of the text, but at the same time also contain significant differences with it. In these cases, it may be that the statistical data are merely the coincidental result of those fragments that were preserved, and that the classification of a scroll would change if additional parts had also been preserved.

This study proposes to bridge the remaining gap in the field, by offering an additional tool for textual classification of biblical manuscripts: material reconstruction of the scrolls with digital tools. In certain instances, when there are differences between the textual versions whose scope is one or more verses – such as editorial additions, large harmonizations, differences in the order of verses, or omitted text – material reconstruction may be able to shed light on the textual tradition to which a manuscript belongs, despite the fact that it preserves the original manuscript only partially. In these cases, after placing the fragments in their approximated locations prior to the scroll’s disintegration, one can estimate the quantity of text missing between them. This estimation can be instructive in determining the textual tradition to which the scroll belongs. It should be noted that scholars of the Qumran scrolls, such as Sanderson (4QExc), and Pfann and Kister (4QcryptA), have employed material considerations in the past for textual classification of scrolls according to textual traditions.[[4]](#footnote-4) Today, however, we have at our disposal advanced tools for material reconstruction which make it possible to achieve better results, and even to propose new reconstructions. The proposed study will demonstrate the potential inherent in the digitization of material reconstruction of the scrolls, for advancement of the study of the scrolls themselves as well as the textual history of the bible, by means of a material reconstruction of 4QpaleoGen-Exl.

**2.2 Material Reconstruction of the Qumran Scrolls**

Stegmann proposed a method for material reconstruction of fragmentary scrolls, according to which one can use repetitive patterns of damage in the fragments of a scroll to identify their respective locations within the original scroll.[[5]](#footnote-5) The premise of this approach is that the patterns of damage formed prior to the disintegration of the scroll, and that whatever caused the damage – for example, dampness or insects – impacted a particular point in the numerous layers of the scroll. The distance between points of damage thus corresponds to the circumference of the rolled up scroll between the two points. The scroll’s circumference increases or decreases between the layers, depending on the direction in which it was rolled up (from the end to the beginning or vice versa), and it is dependent, to a large extent, on how tightly the scroll was rolled up and the thickness of its parchment. Stegmann demonstrated his method by reconstructing 1QHa, and his approach has been applied and expanded in later studies carried out by such scholars as Steudel, Tigchelaar, and Davis.[[6]](#footnote-6)

Bible scholars have made use of the material element of the biblical scrolls in order to classify them textually. Sanderson dealt with this in her critical edition of 4Qpaleo-Exm, thought not comprehensively.[[7]](#footnote-7) Fink wrote a monograph dealing with the material reconstruction of 4QSama, and comparing it to the Septuagint version of the book and of 4QSamc.[[8]](#footnote-8) A book by Torleif Elgvin, currently in print, deals with the material reconstruction of the Samuel scroll from Cave 1. My study attempts to follow this path, proposing as comprehensive as possible a reconstruction of 4QpaleoGen-Exl, by means of innovative use of digital tools.

In the critical edition of 4QpaleoGen-Exl, Skehan, Ulrich and Sanderson offer a partial material reconstruction of the scroll. On the basis of that reconstruction they concluded that the scroll reflects a text of a length similar to that found in the Masoretic version, and does not include the lengthy additions found in the Samaritan textual branch.[[9]](#footnote-9) Their reconstruction is based on fragments of the scroll that include a lower sheet and spaces between columns, however they did not use Stegmann’s method and did not identify damage patterns that are repeated in the scroll’s fragments. The proposed study thus aims to fill this lacuna, offering as full a reconstruction as possible of the scroll, on the basis of Stegmann’s method. One hopes that, following the reconstruction, it will be possible to complete the missing text between fragments of the scroll and estimate its quantity. In this way, it will be possible to reexamine the matter of textual classification of the scroll.

**3. Methodological Considerations in Selecting the Text: 4QpaleoGen-Exl (4Q11)**

The scroll known as 4QpaleoGen-Exl preserves a relatively large quantity of text, and it has fragments that contain a lower sheet (Fragments 10, 35), spaces between columns (Fragments 2, 5, 7, 10, 30), and seams between sheets (Fragments 1, 19, 20, 23, 42, 44, 50). These data constitute a good starting point for work on the material dimension of the scroll.

Moreover, the incidences of agreement between the scroll and each of the textual traditions of the Pentateuch does not allow the drawing of unequivocal conclusions regarding its textual classification: There are 25 cases in which the scroll’s version corresponds to that of the Masoretic version, and 25 in which it differs; 12 cases in which the scroll’s version corresponds to that of the Samaritan Pentateuch and 38 in which it differs; 15 cases in which the scroll’s version corresponds to the Hebrew base text for the Septuagint, and 24 in which it reflects a different Hebrew version; and 12 cases in which the scroll’s version of the text is not classified.[[10]](#footnote-10) Since the statistical tools do not enable classification of the scroll, its material aspect must be studied in order to examine the degree to which it can contribute to characterizing the text textually.

An additional consideration in selecting this scroll is the fact that it documents large parts of the book of Exodus. As noted above, material reconstruction is likely to be of assistance where there are differences of one verse or more between versions of the text. In such cases, we can attempt to estimate the quantity of text in the scroll, and on that basis determine the textual tradition to which it belongs. Significant redactional differences between the versions of the three textual traditions are found principally in the books of Exodus and Deuteronomy. As such, this research can be carried out only on scrolls that document a sufficient quantity of text from these books.

**4. Stages of the Study**

The study will be carried out in several stages:

1. Use of new images of the fragments of the scroll (Israel Antiquities Authority), and preparation of the fragments for the study using image editing software (GIMP).
2. Preparation of a font for the manuscript of the scroll, using software for creating fonts (Glyphs).
3. Proposed model for material reconstruction of the scroll:
4. Identifying patterns of damage in the fragments.
5. Placement of the fragments on a digital canvas on a parallel contour line, based on appropriate points of damage patterns. I will use image editing software, such as Photoshop and Adobe Indesign, to create the digital canvas. Distances between fragments will show a consistent increase or decrease in the circumference of rolls of the scroll.
6. Completion of the missing text between fragments, according to each of the textual traditions, using the scroll’s font. I will examine which textual version is most suited to filling in the scroll’s missing text, based on an estimate of the quantity of text missing from the original scroll according to the material reconstruction.
7. Calculation of the theoretical margin of error in measuring the distances between fragments, and in filling in the text using the scroll’s font.
8. Analysis of the data and drawing of conclusions: This stage will be devoted to a broad analysis of the findings. From a textual perspective, I will examine whether the original scroll contained the harmonistic additions found in the Samaritan version of the text of Exodus, only some of them, or if it corresponds, rather, to the shorter Masoretic version. The implications of this conclusion will be examined in light of the textual condition of other manuscripts of Exodus from Qumran.

**5. Significance of the Study**

This study employs innovative digital tools and integrates the material study of the Qumran scrolls with study of versions of the biblical text. Its primary importance lies in the conclusions it will produce through the material reconstruction of 4QpaleoGen-Exl, as well as the implications for textual classification of the scroll. In addition, the study bears methodological importance. One hopes that the interdisciplinary approach proposed for this study will serve as a methodological tool for the study of other fragmentary biblical scrolls, which I hope will lead to significant results both materially and in terms of the scrolls’ content.

The study’s innovativeness lies also in the fact that it employs technological aids in order to decode fragmentary scrolls whose investigation could not be completed for many decades. By means of cutting-edge technology it is possible to acheive a breakthrough in the study of these scrolls, adding to the existing scholarly work. Use of the method proposed here is likely to impact our understanding of the transmission of the biblical text in the ancient period in particular, as well as our understanding of the intellectual history of Israel in that period more generally.

1. Skehan, Ulrich and Sanderson 1992, p. 21; Lange 2016a, p. 24. [↑](#footnote-ref-1)
2. Tov’s methodology is detailed in a series of publications found in volumes collecting his writings: Tov 1999; Tov 2008; Tov 2015. [↑](#footnote-ref-2)
3. See, for example, Lange 2016. Different explanations have been given as to how textual variations formed in the last centuries B.C.E., and I will mention the most central of them. Kutcher 1959, pp. 57-61, held the view that, during the Second Temple period, popular texts were disseminated to serve private needs. These texts were transmitted freely, alongside texts preserved from the pre-Masoretic tradition, which were transmitted carefully on the basis of copies deposited at the Temple. Albright 1955 and Cross 1975 developed the hypothesis of local recensions, according to which the three textual traditions of the Pentateuch developed in three different geographical areas after the exile: the pre-Samaritan textual branch developed in Judea; the pre-Masoretic textual branch in Babylonia; and the textual branch of the Septuagint developed in Egypt. In the final centuries B.C.E., as part of the return from exile, texts from all of these branches were gathered in Judea. [↑](#footnote-ref-3)
4. Sanderson 1994, pp. 97-100; Pfann and Kister 1997, pp. 5-6. [↑](#footnote-ref-4)
5. Stegmann 1990. [↑](#footnote-ref-5)
6. Steudel 1999; Tigchelaar 2010; Davis 2014, pp. 70-102. [↑](#footnote-ref-6)
7. Sanderson 1992. [↑](#footnote-ref-7)
8. Fink 2001. [↑](#footnote-ref-8)
9. Skehan, Ulrich and Sanderson 1992, p. 24. [↑](#footnote-ref-9)
10. According to Lange 2016a, p. 24. [↑](#footnote-ref-10)